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# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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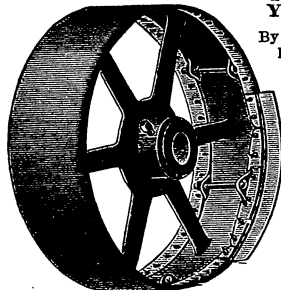
Vol. LIV: No. 1.

New York, Thursday, July 5 1894.

\$4.50 a Year, including Postage.  
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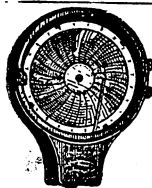
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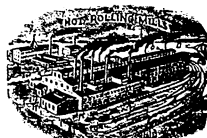
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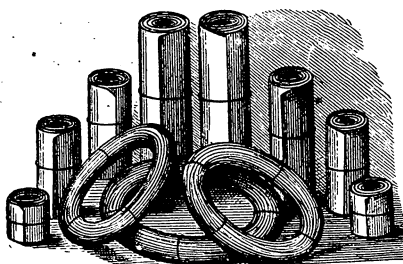
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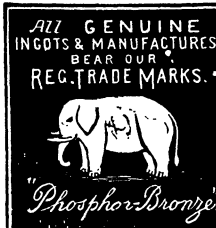
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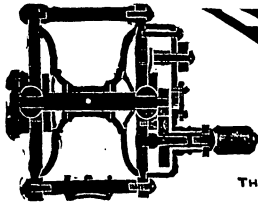
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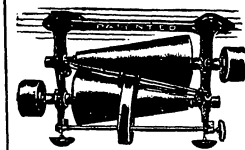
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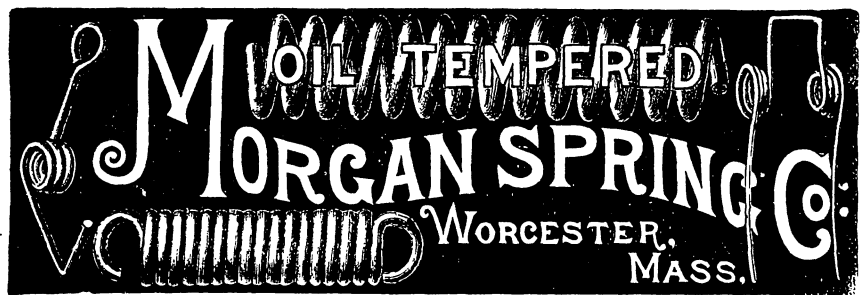
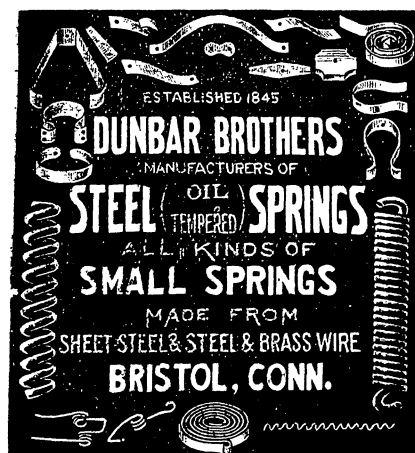
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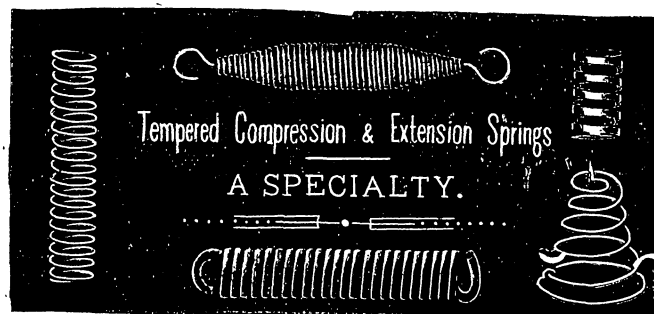
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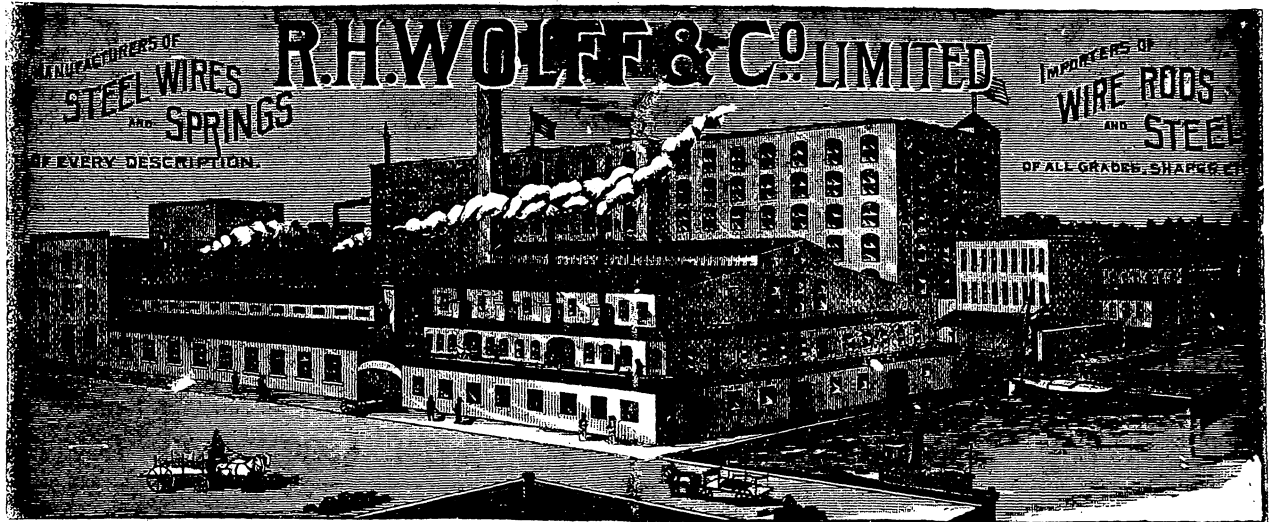


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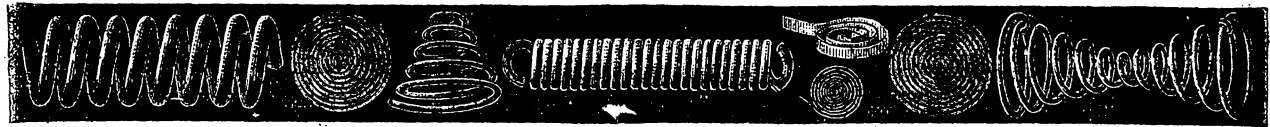
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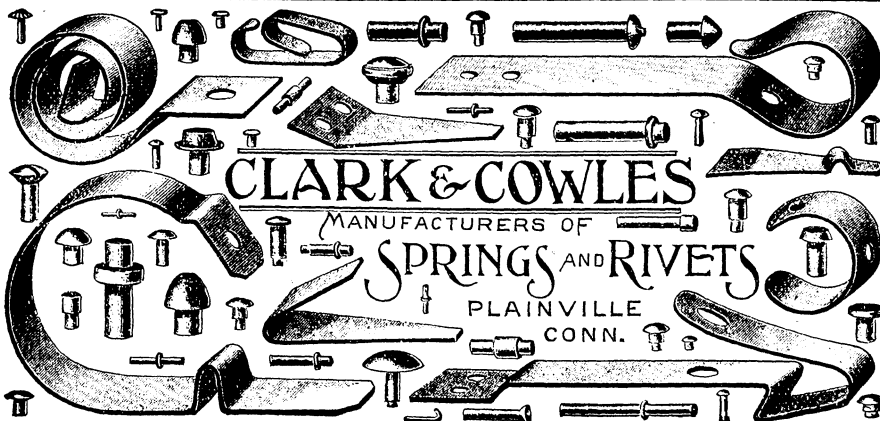
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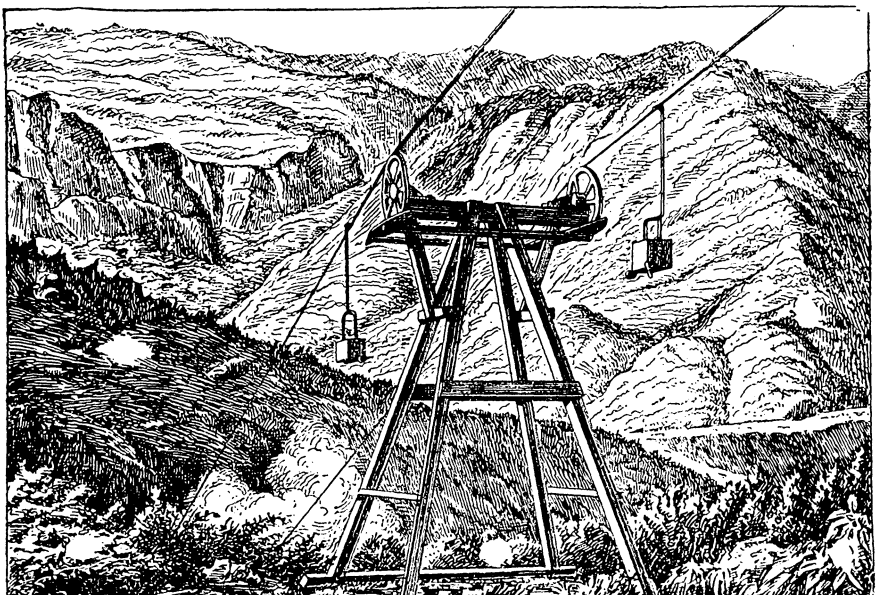
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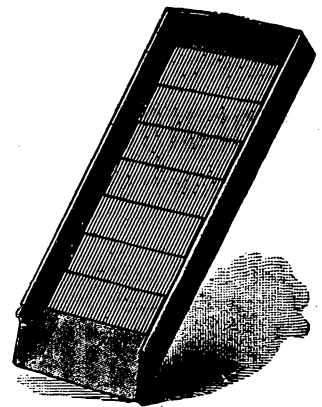
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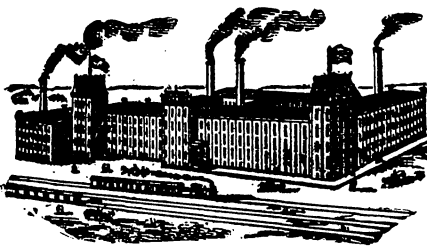
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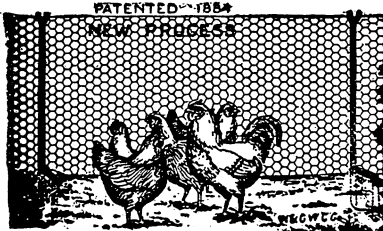
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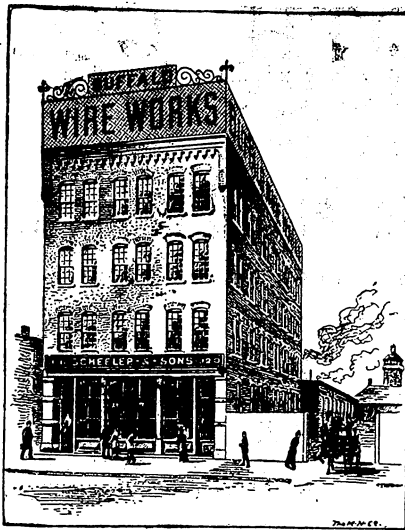
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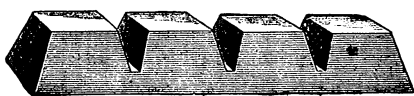
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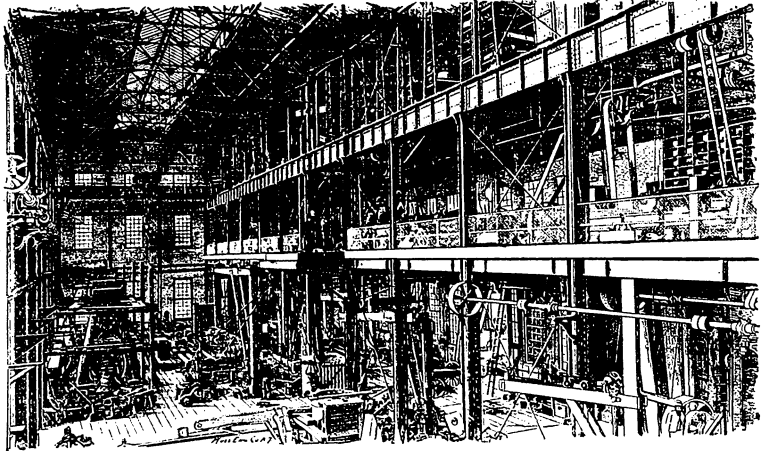
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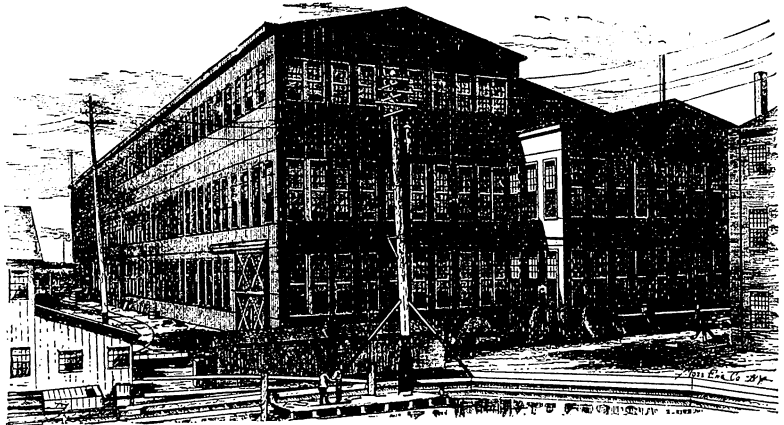
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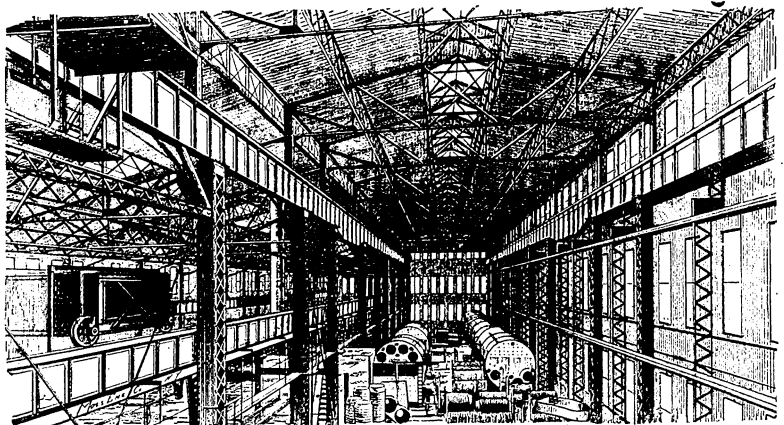
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The above illustration is an exterior view of the Boiler Shop and Blacksmith Shop designed and built by us for The Wm. Cramp & Sons Ship and Engine Building Co., at Philadelphia, Penn. The building is 114 feet in width and 315 feet in length, the frame work being of iron, covered with corrugated iron.



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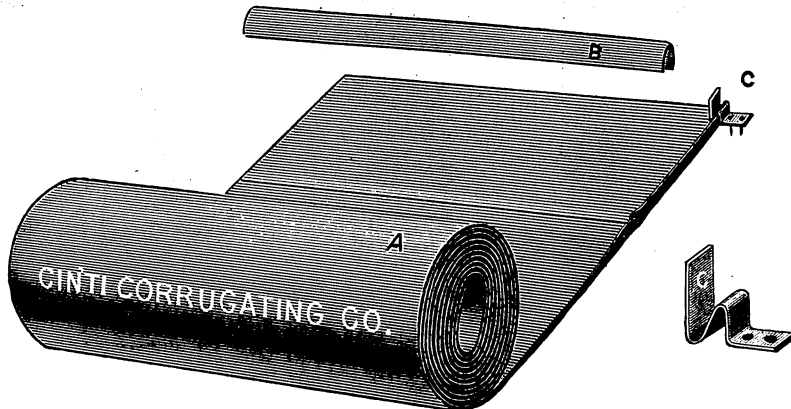
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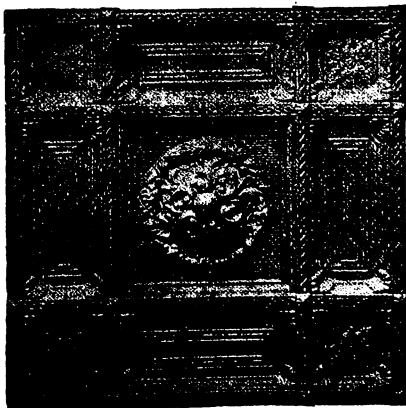
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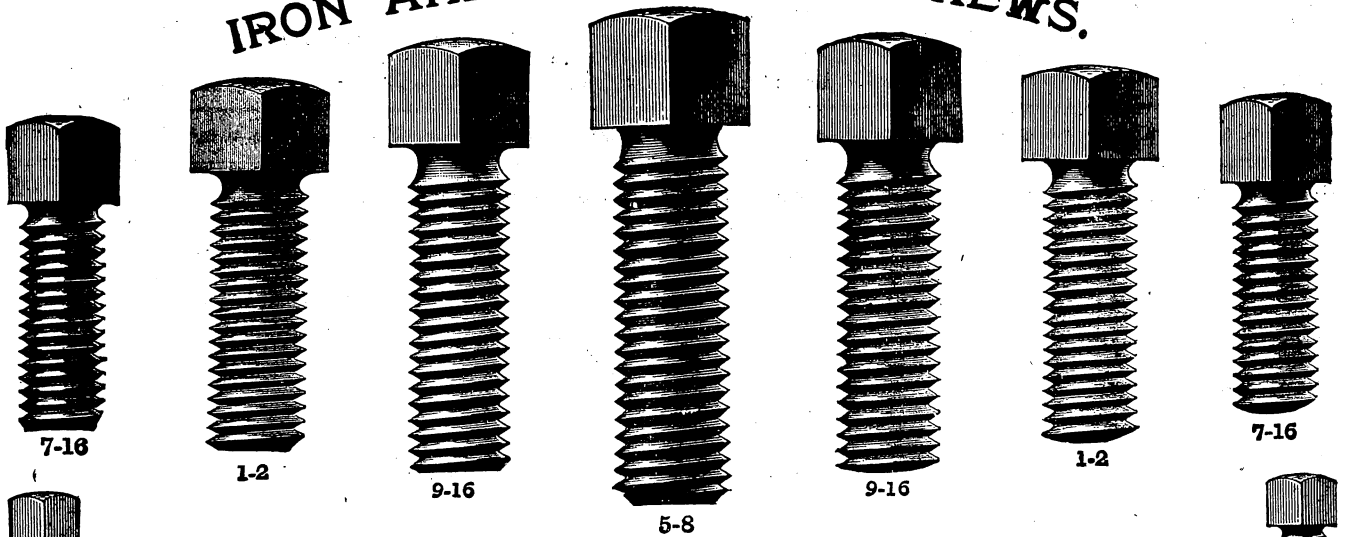
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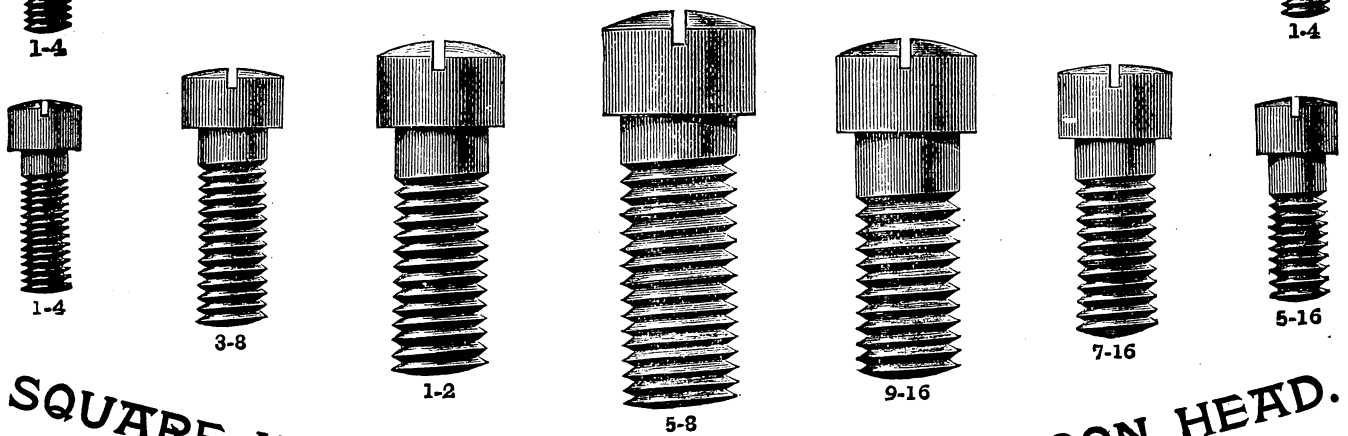
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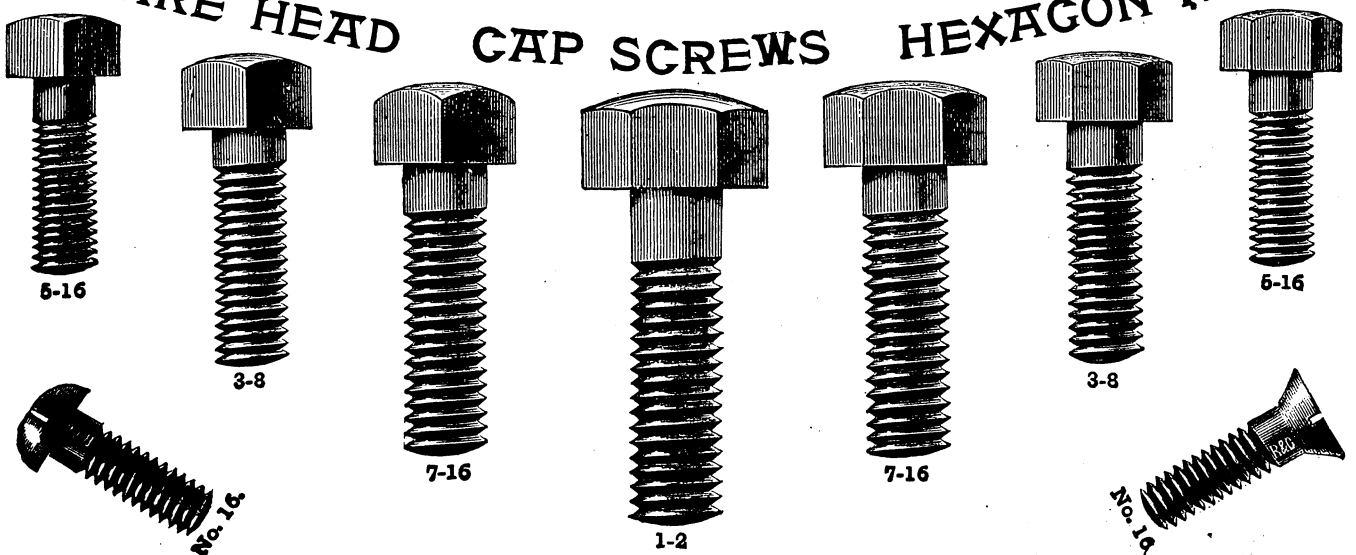
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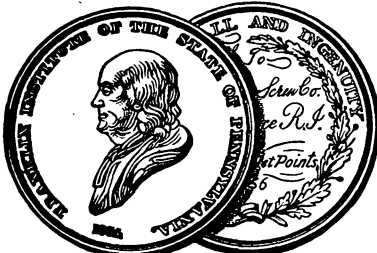
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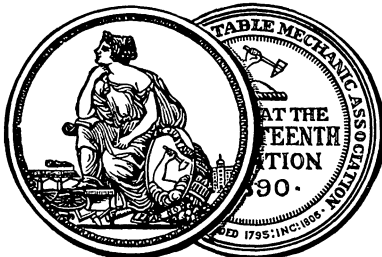
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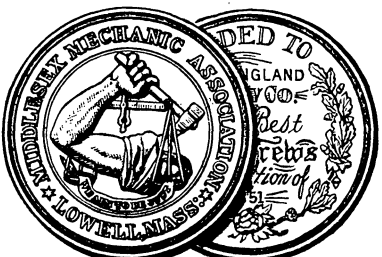
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MASS. CHARITABLE MECHANIC ASS'N  
1890



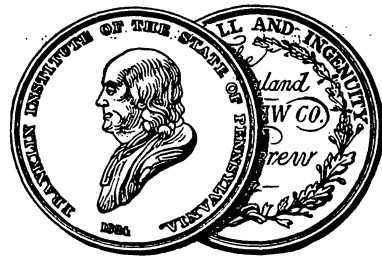
EXPOSITION UNIVERSELLE  
PARIS, 1889



MIDDLESEX MECHANIC ASSOCIATION  
1855



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1842



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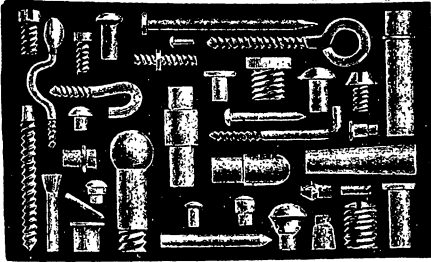
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1847



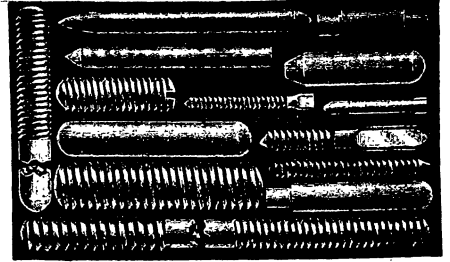
WORCESTER CO. MECHANICS ASS'N  
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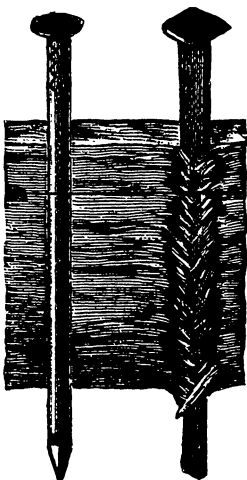
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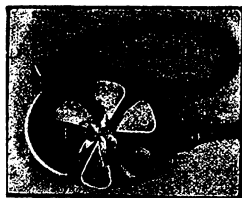
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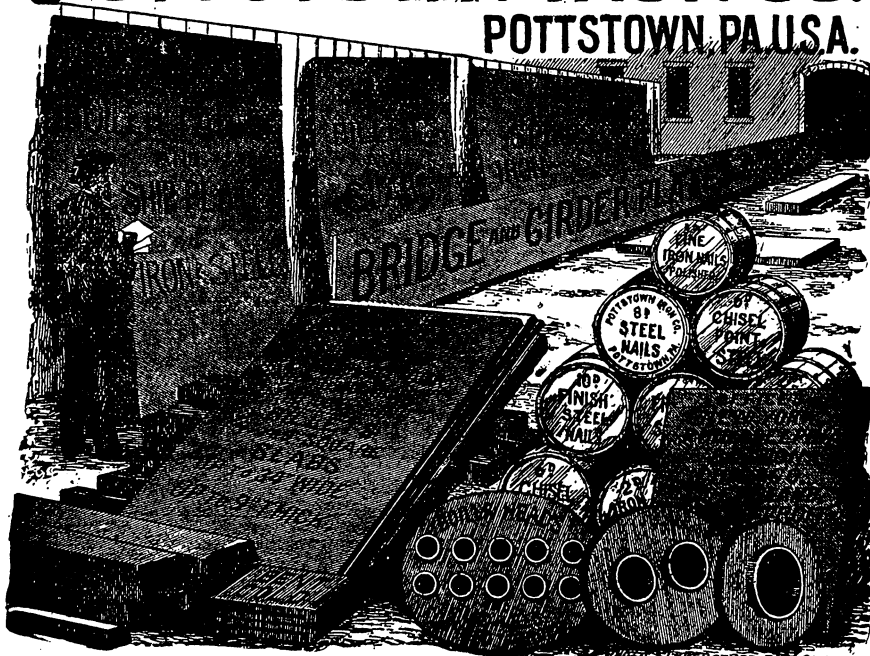
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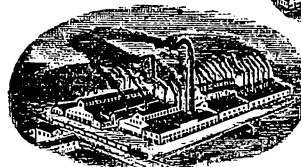
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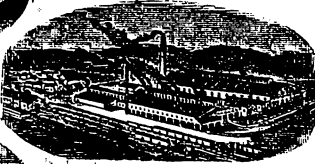
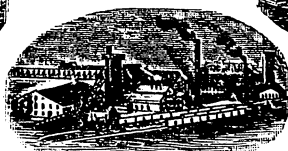
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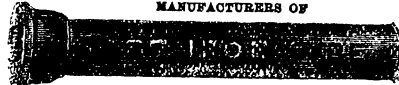
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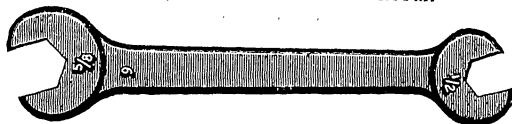
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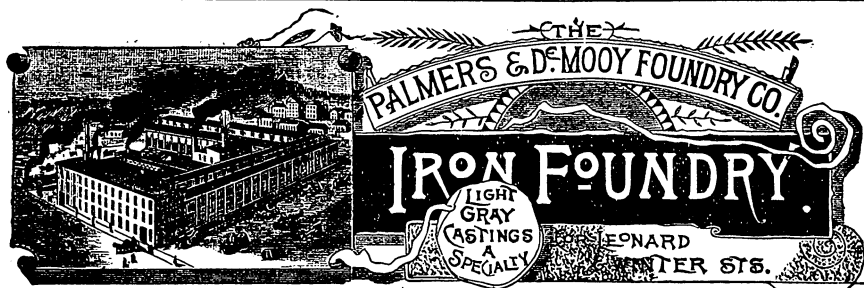
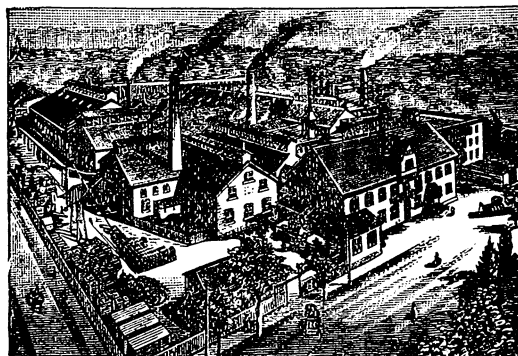
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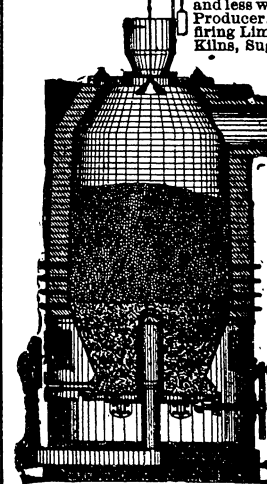
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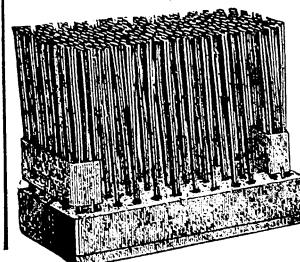
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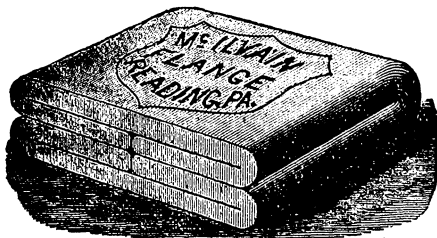
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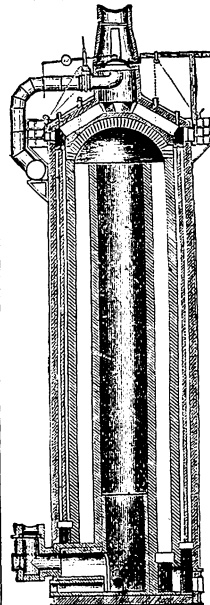
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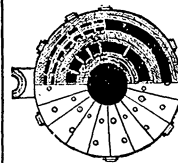
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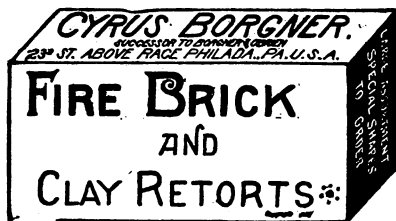
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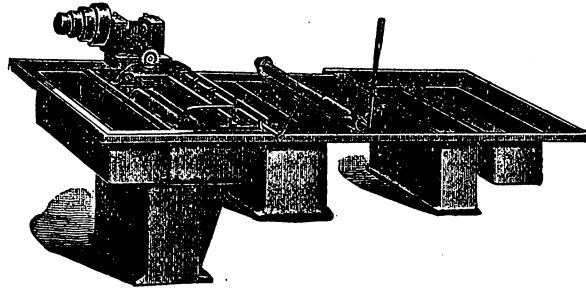
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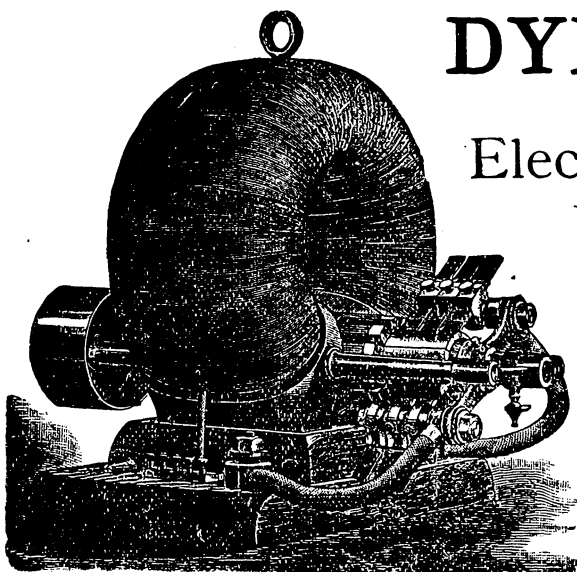
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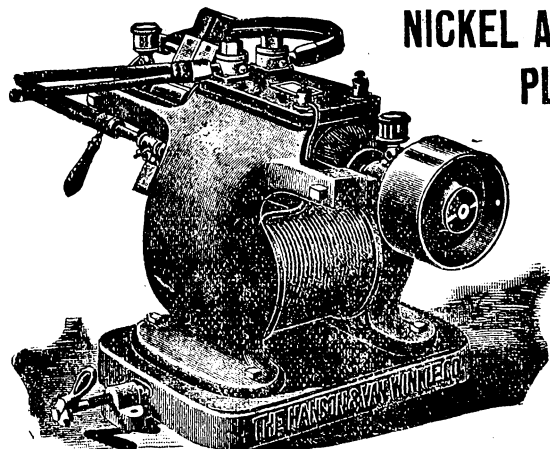
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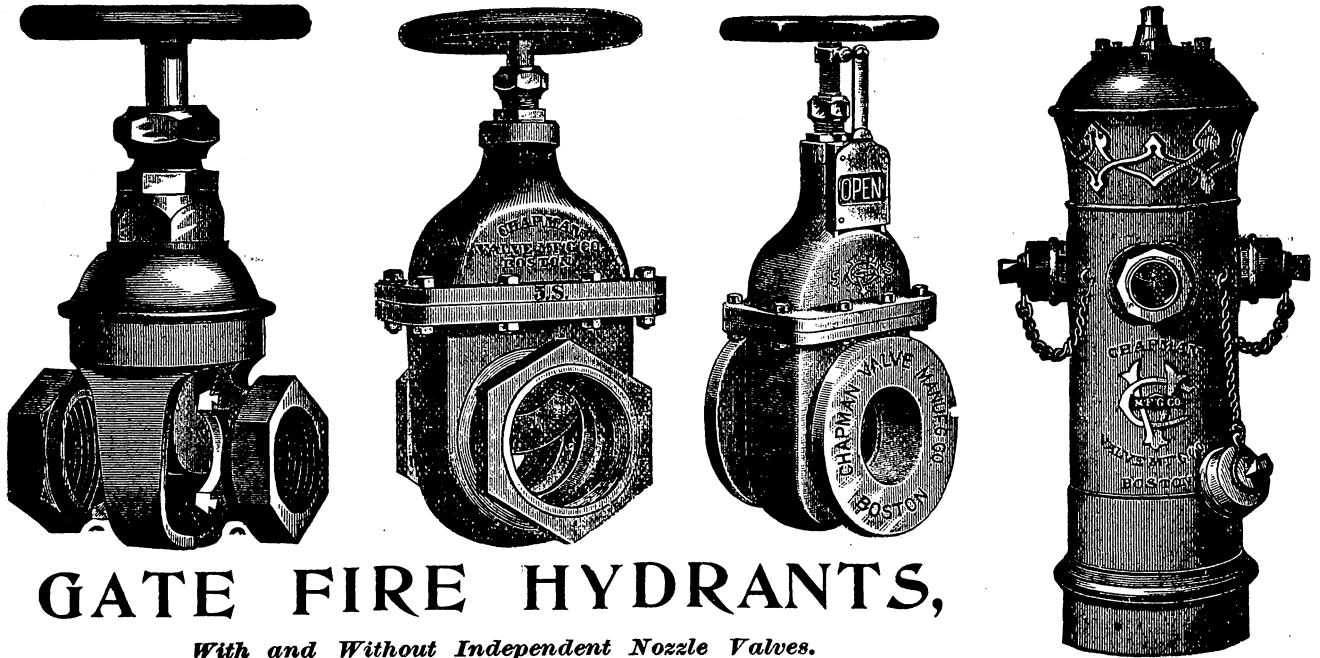
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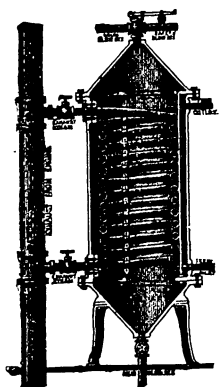
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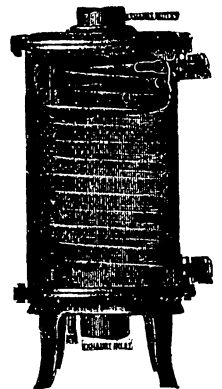
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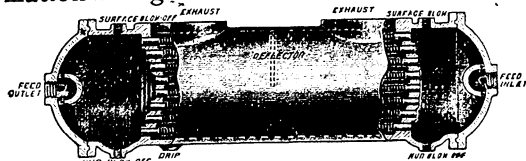
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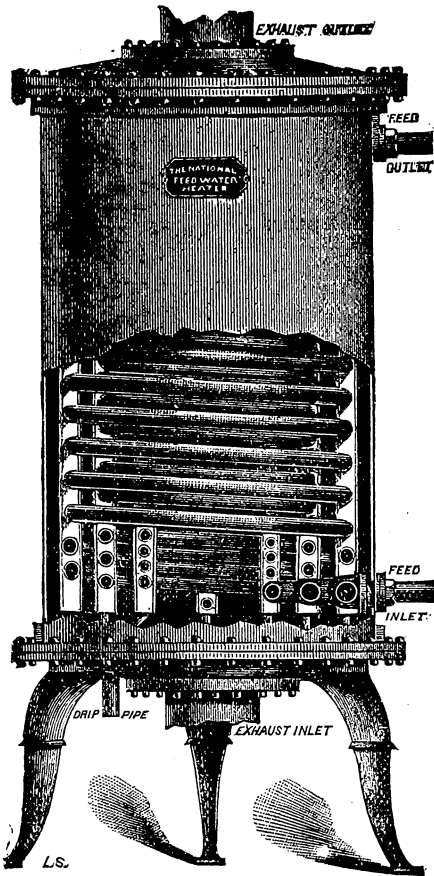
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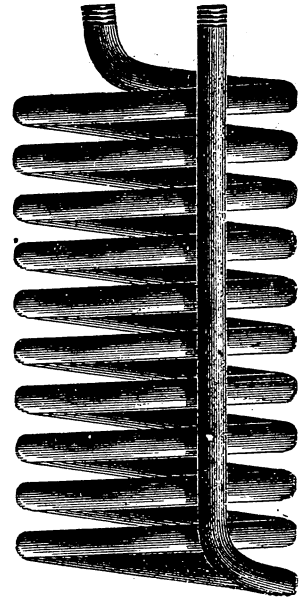
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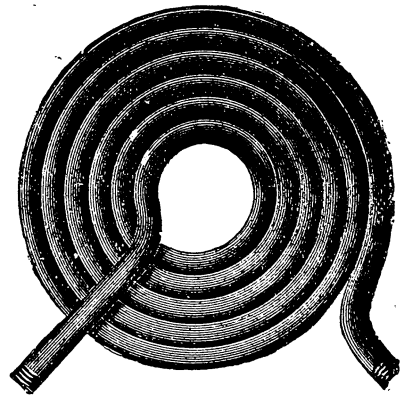
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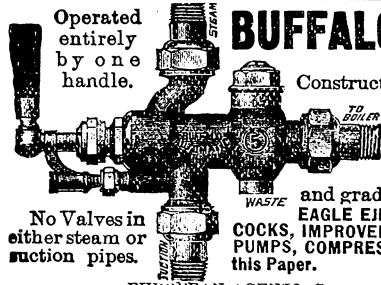
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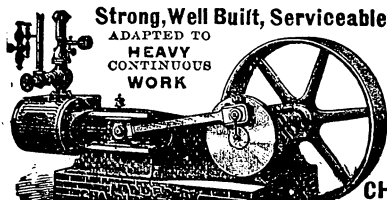
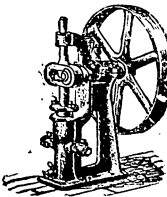
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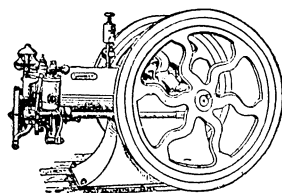
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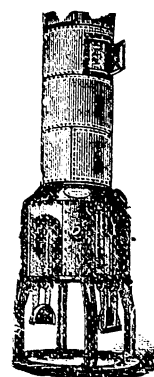
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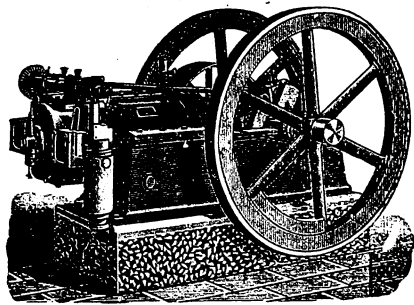


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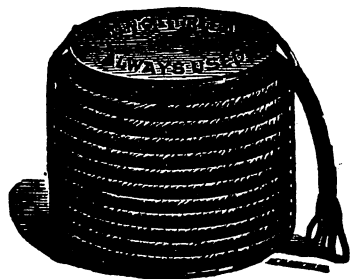
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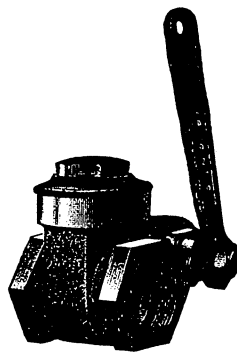
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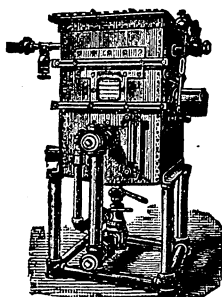
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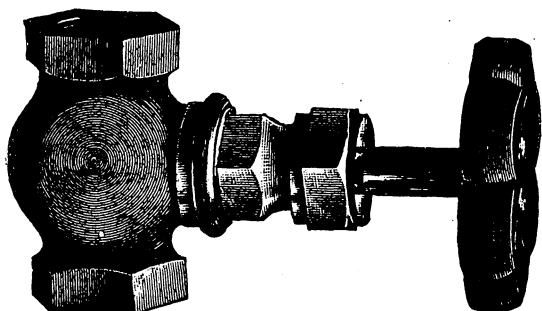


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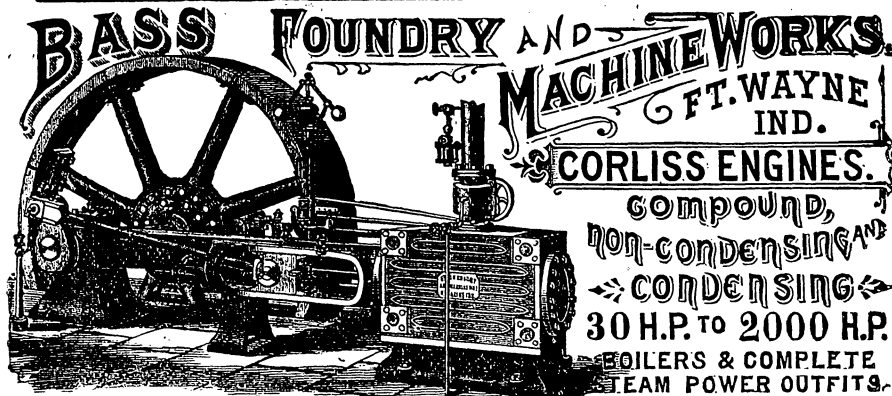
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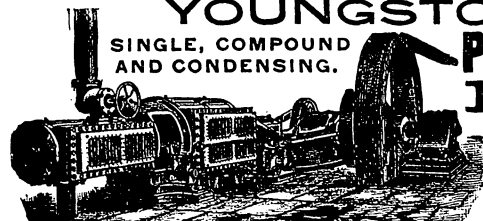
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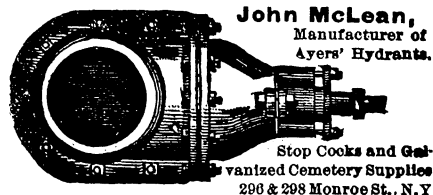
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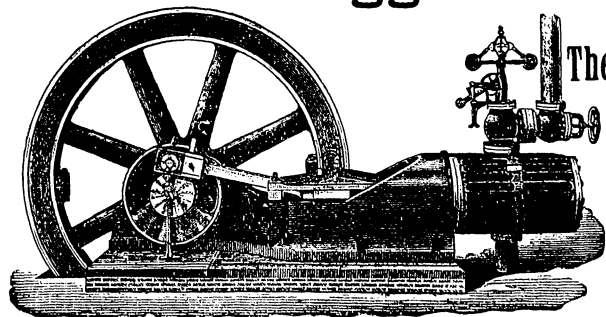
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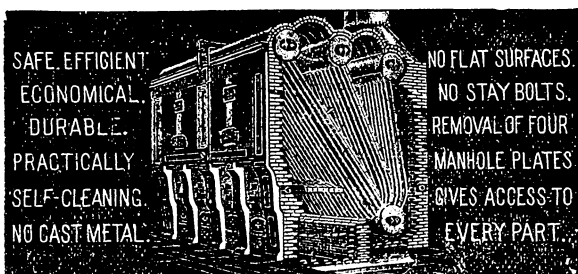
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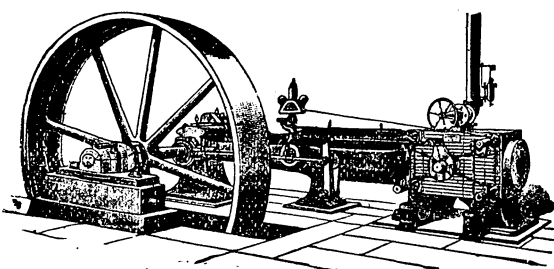
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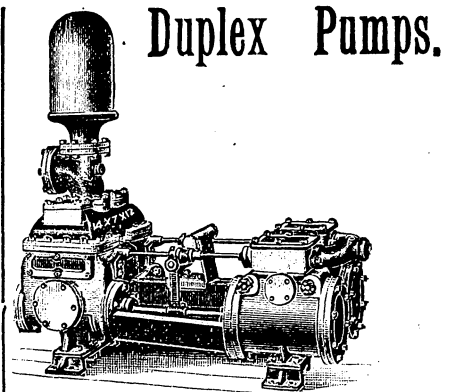
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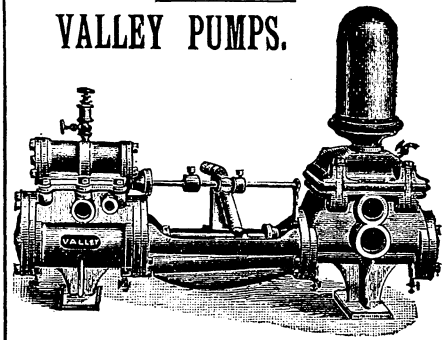
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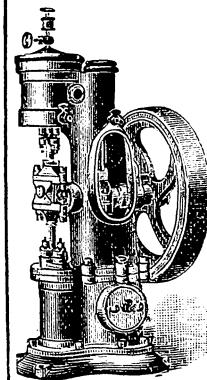
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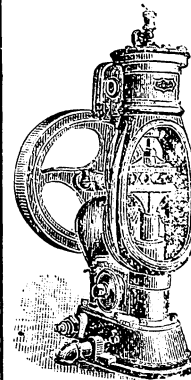


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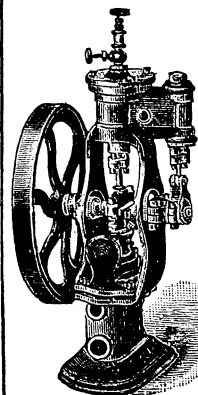
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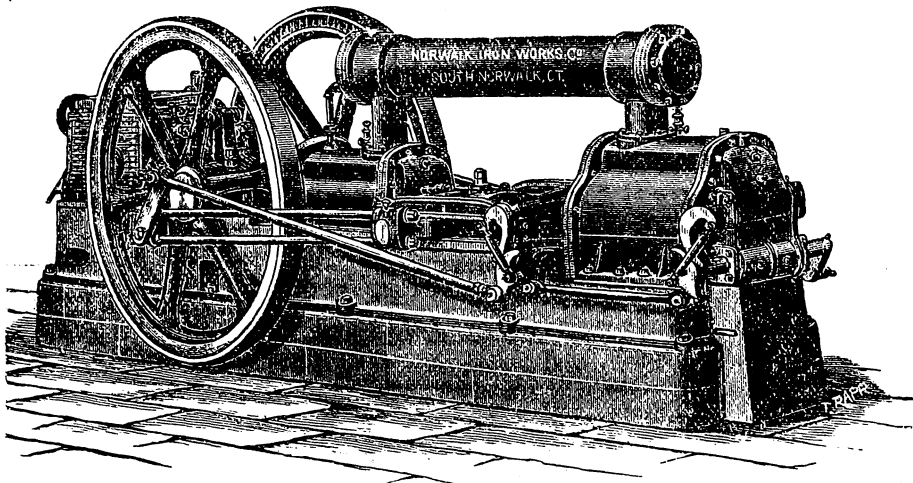
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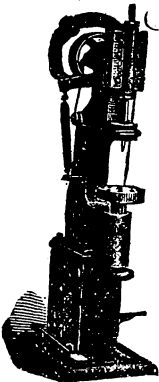
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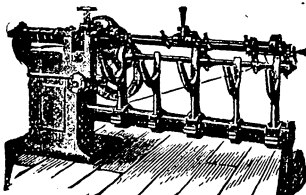
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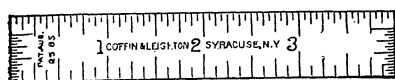
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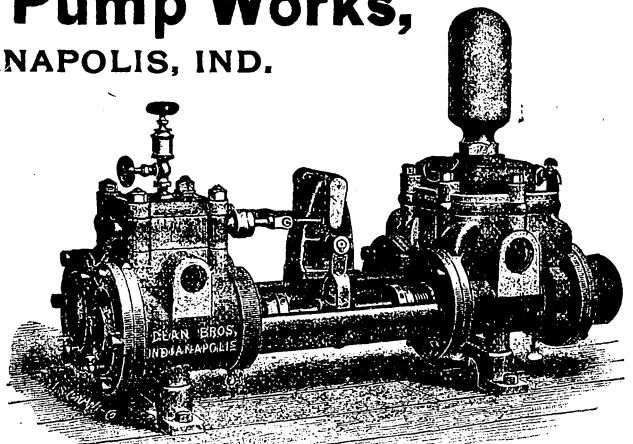
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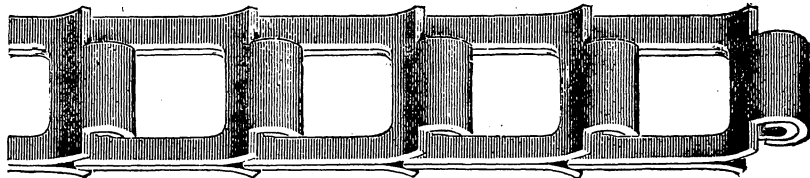
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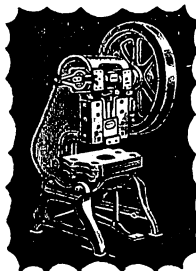
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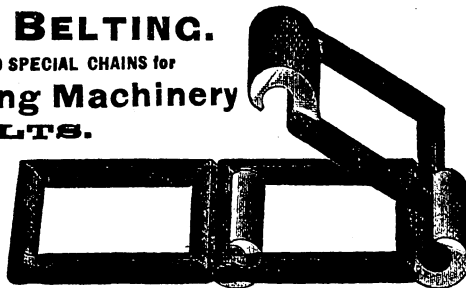
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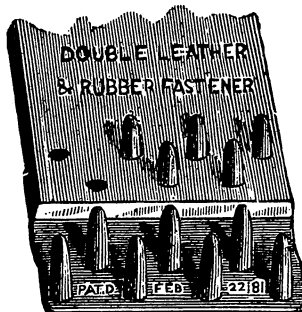
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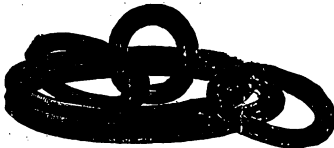
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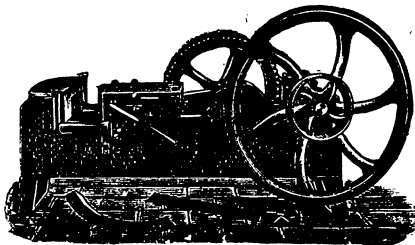
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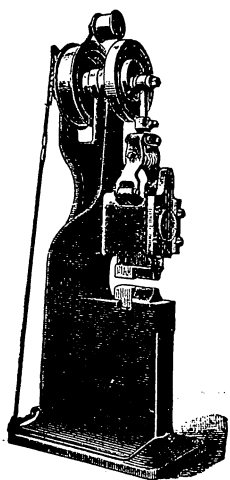
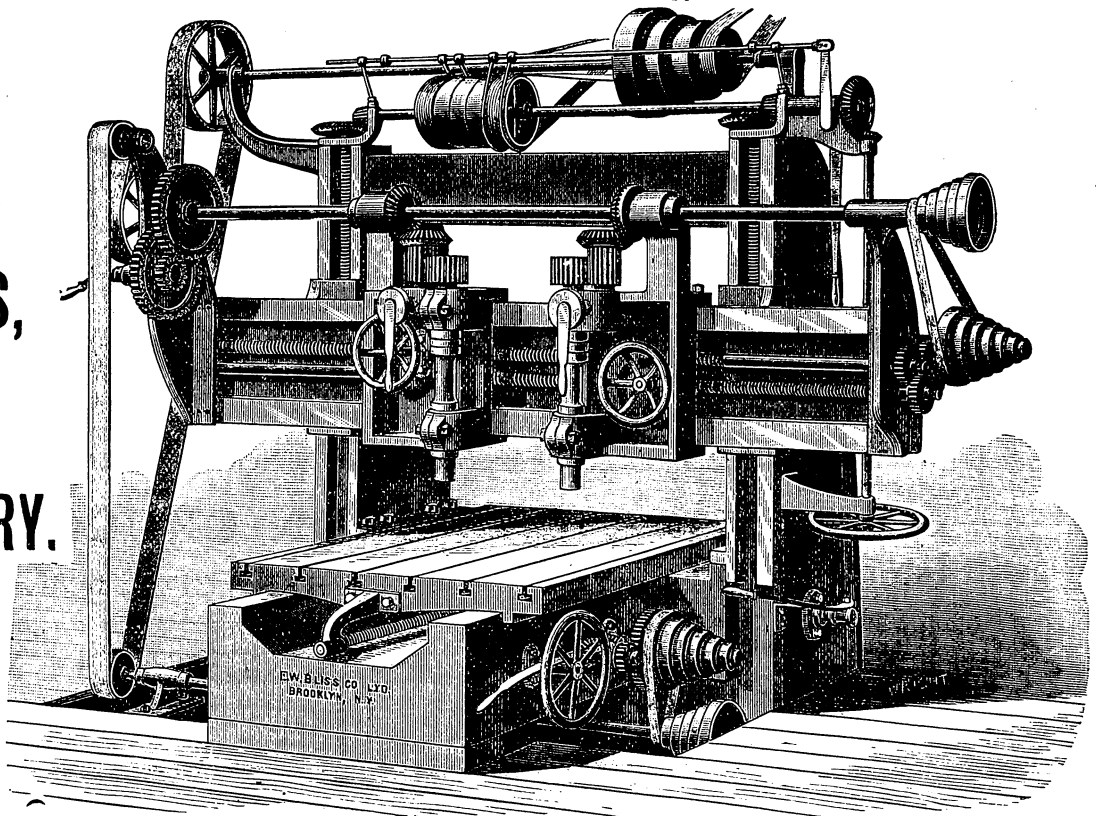
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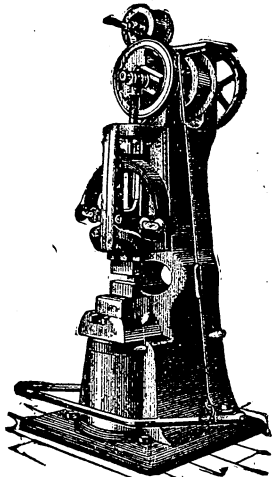
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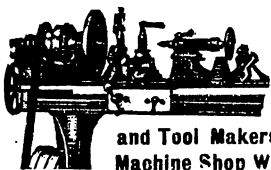
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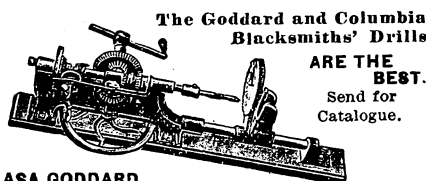
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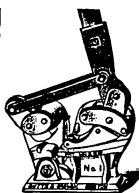
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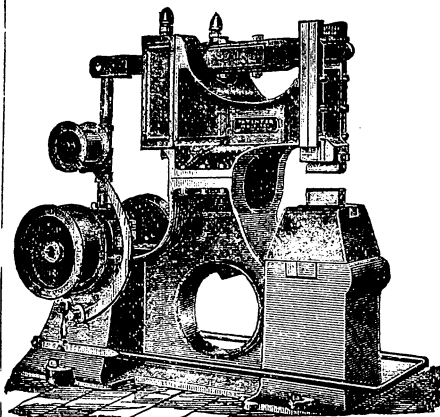
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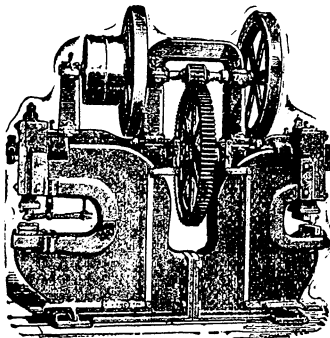
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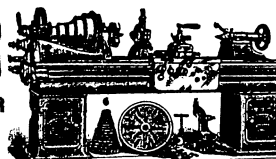
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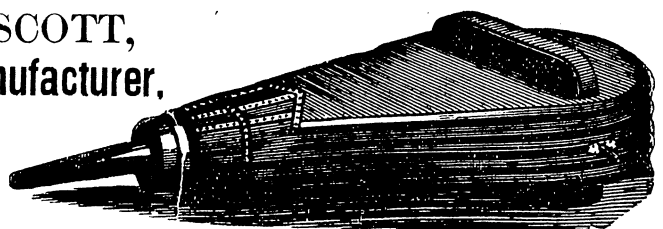
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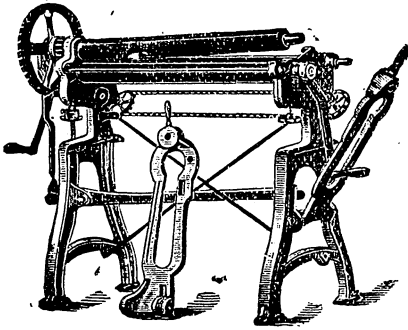
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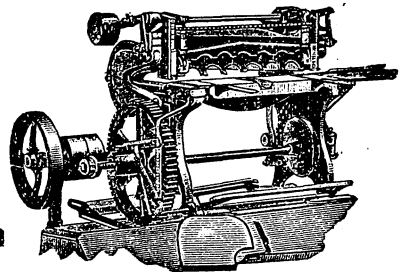
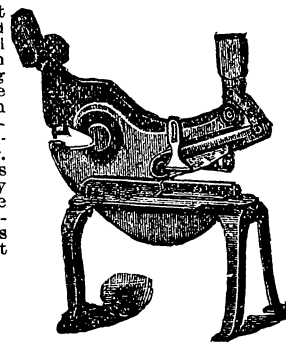
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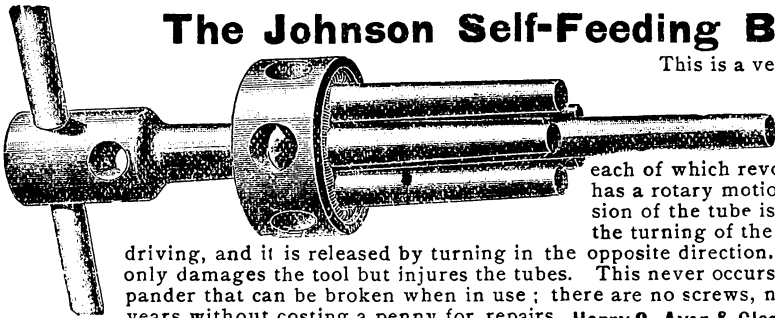
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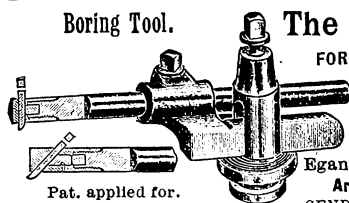


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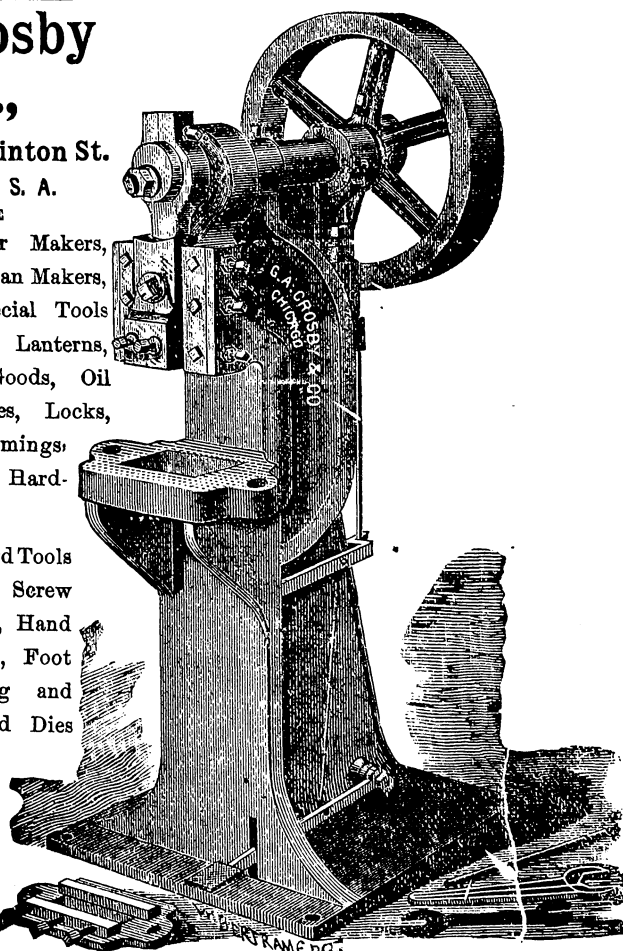
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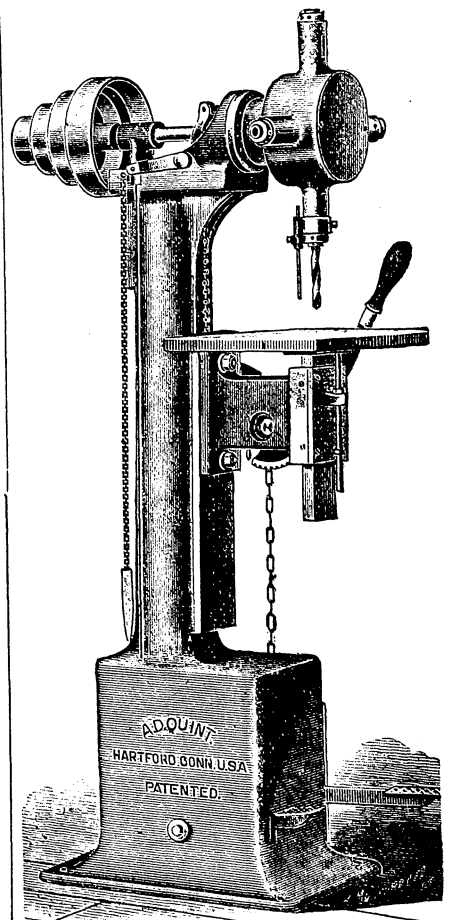
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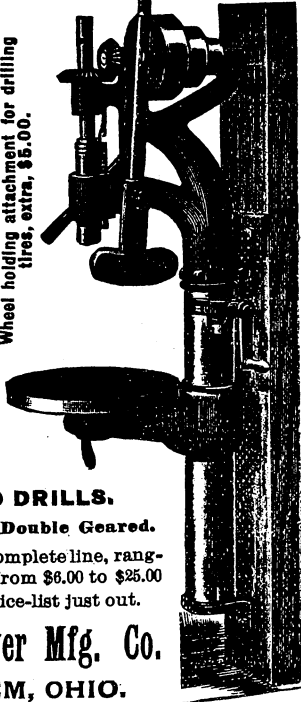
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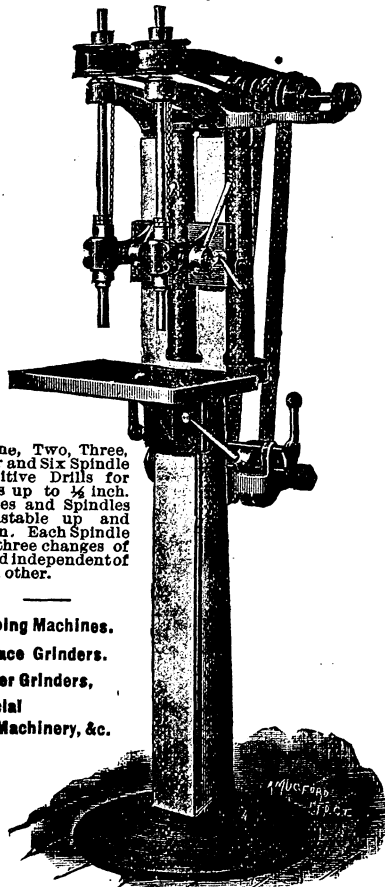
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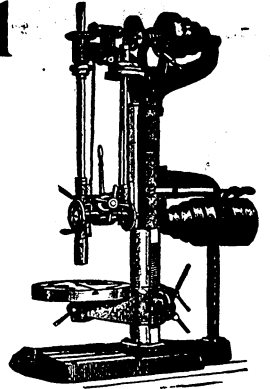
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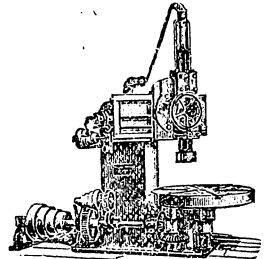
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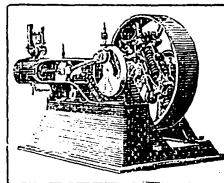
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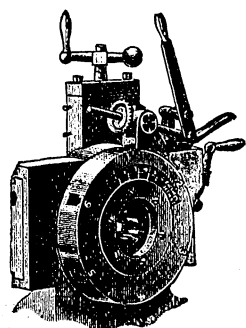
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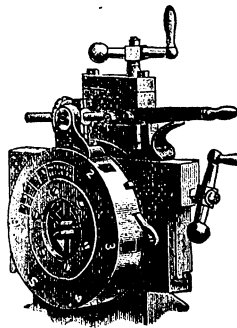
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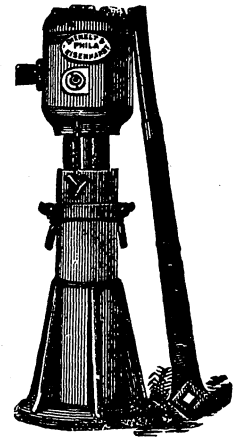
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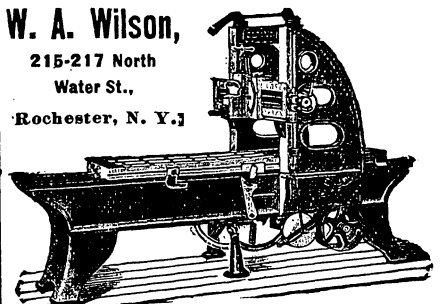
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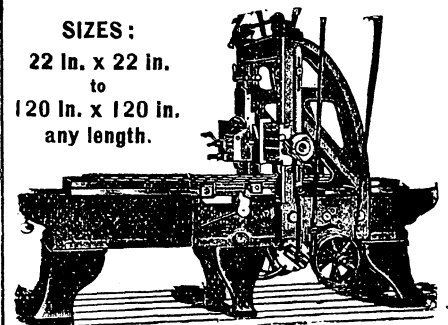
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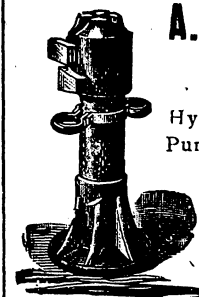
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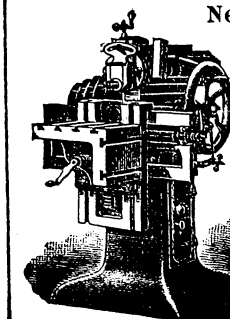
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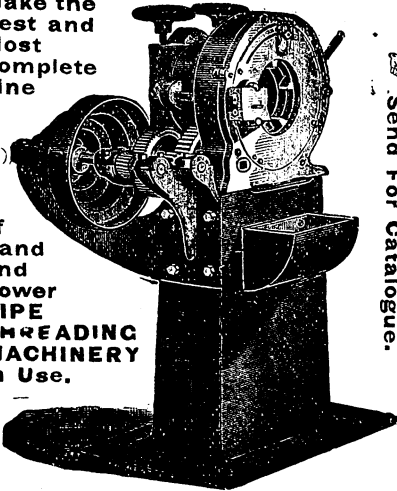
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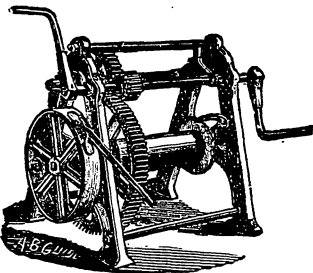


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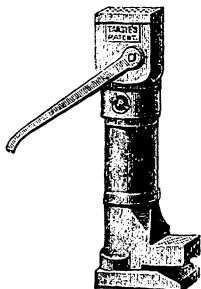


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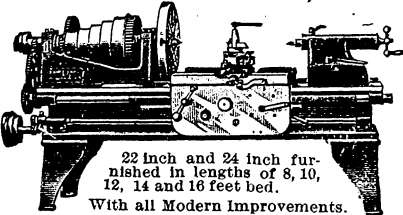
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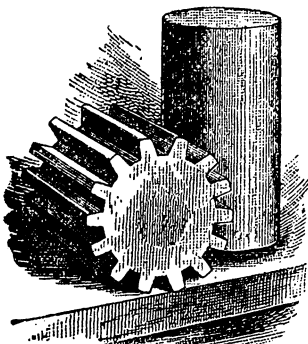
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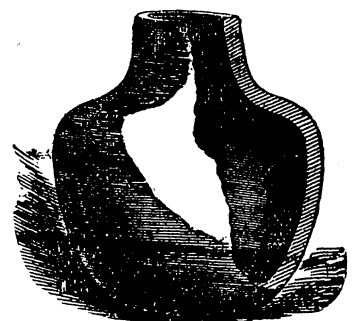
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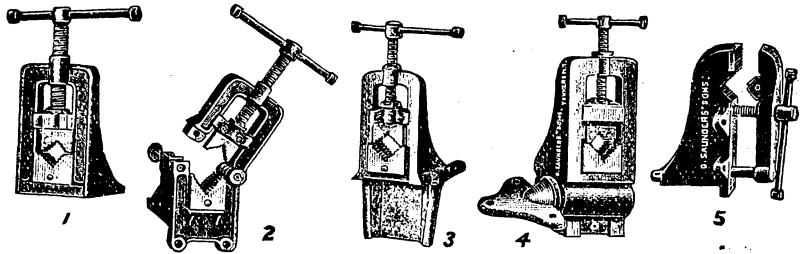
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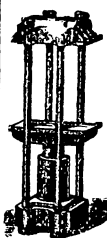


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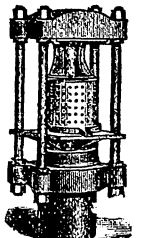
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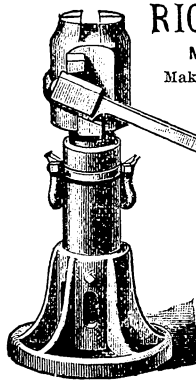
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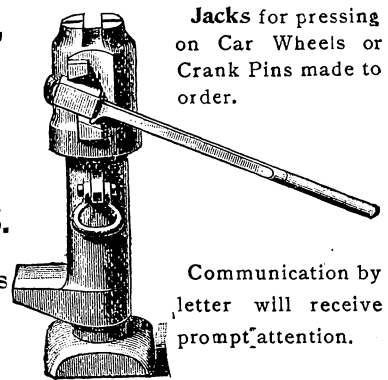
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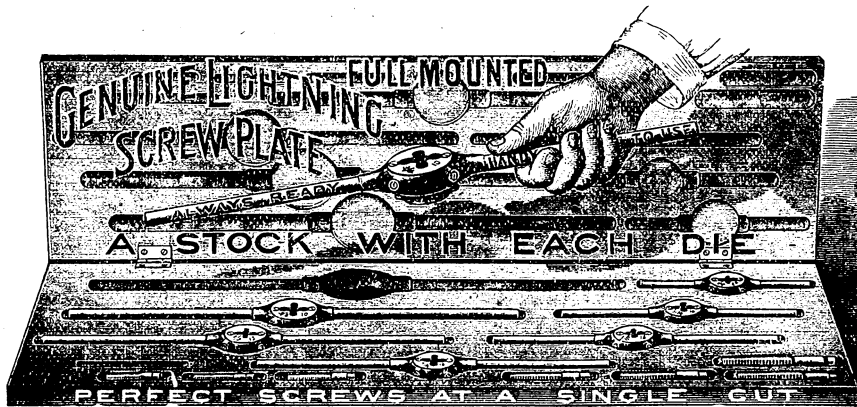


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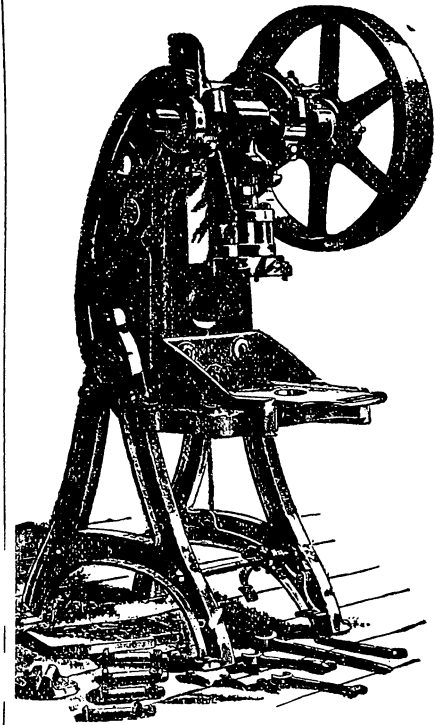
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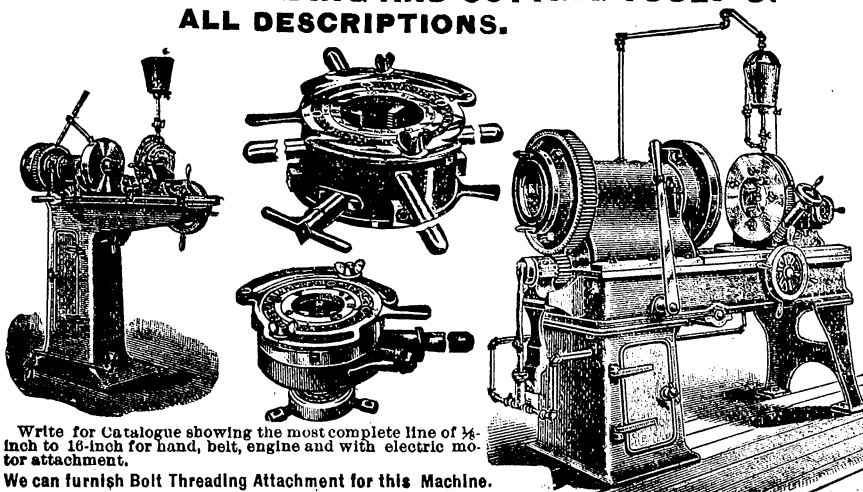
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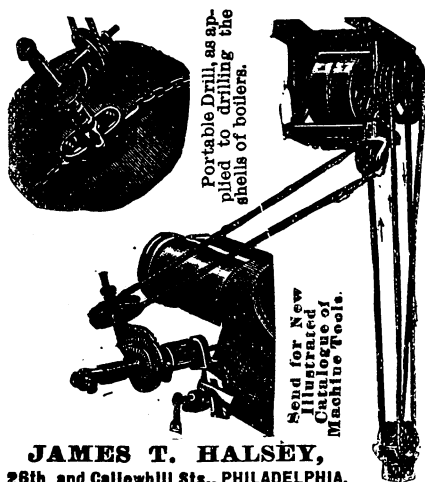
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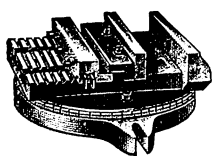
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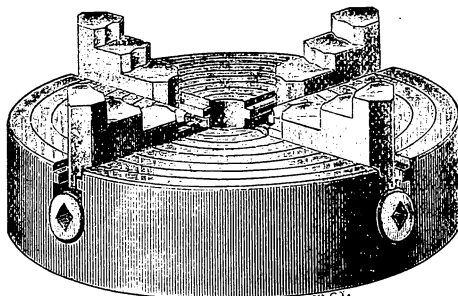
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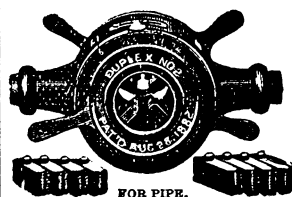


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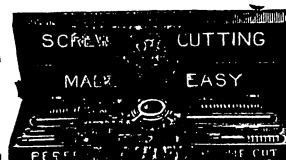
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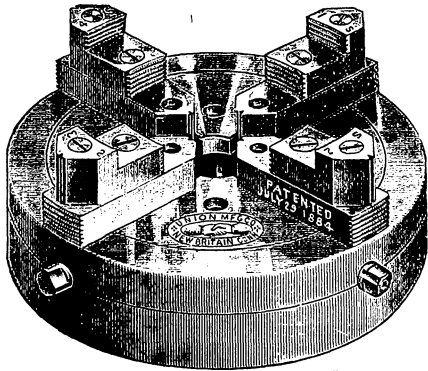


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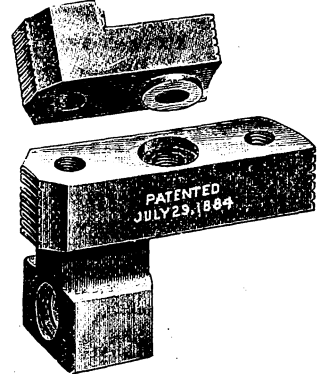
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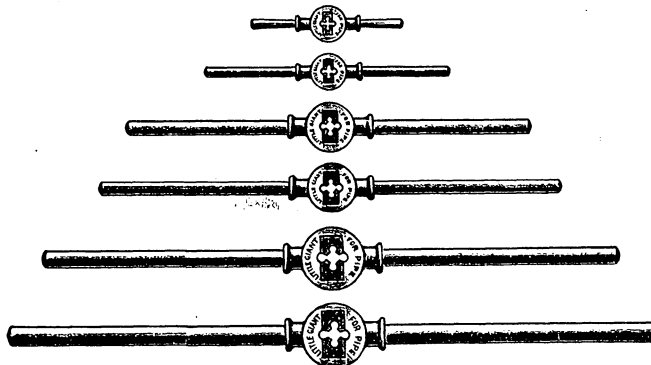
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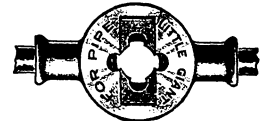
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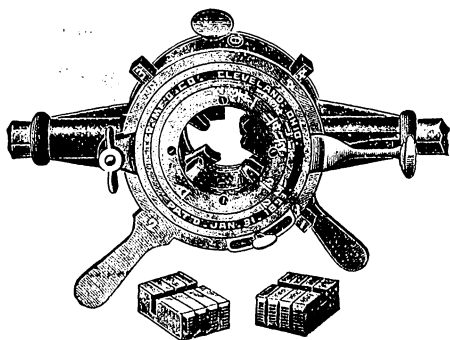
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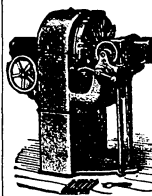
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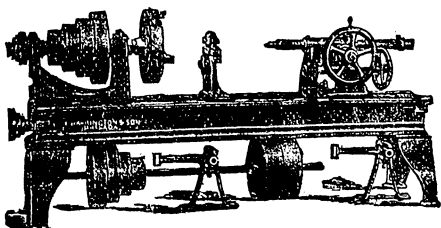
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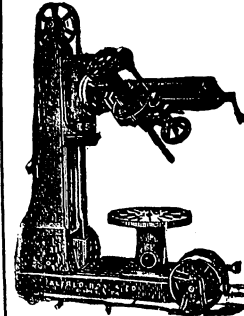
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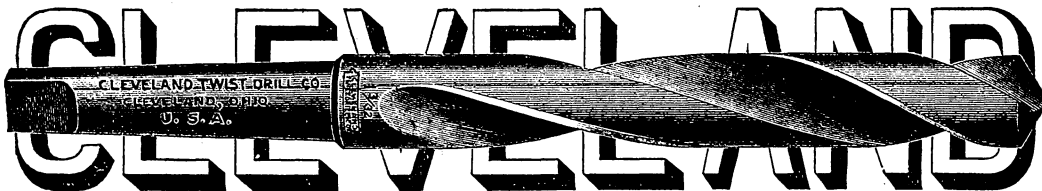
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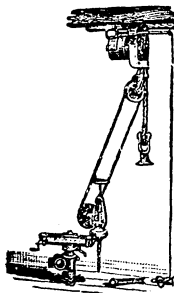
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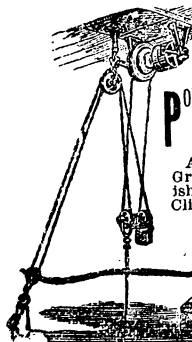
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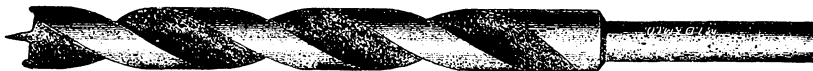
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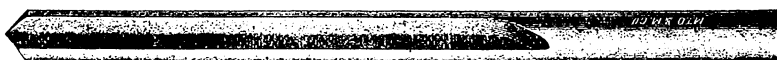
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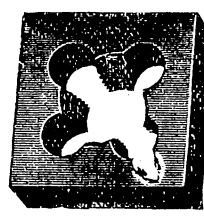
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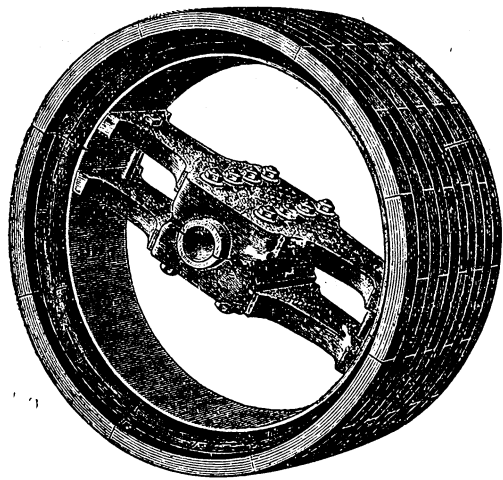
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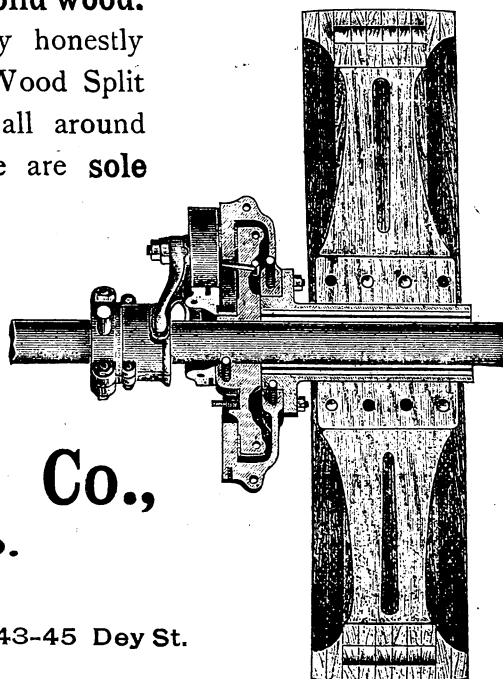
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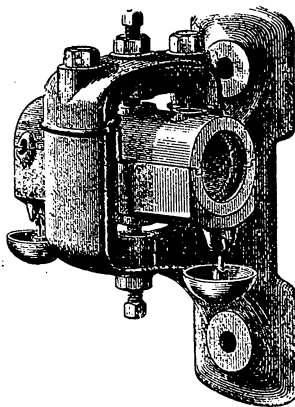
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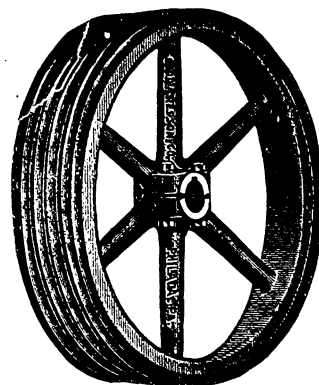
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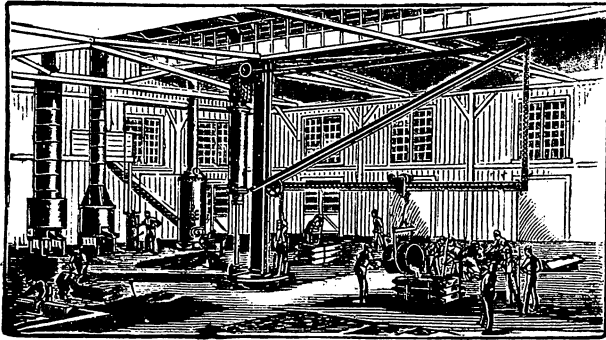
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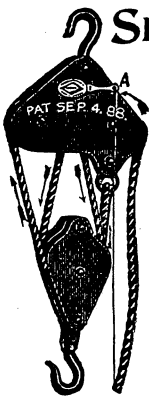
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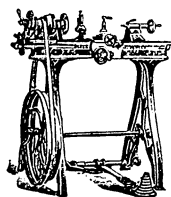
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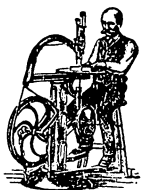
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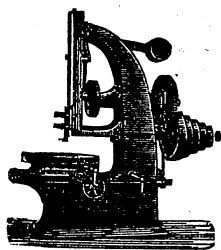
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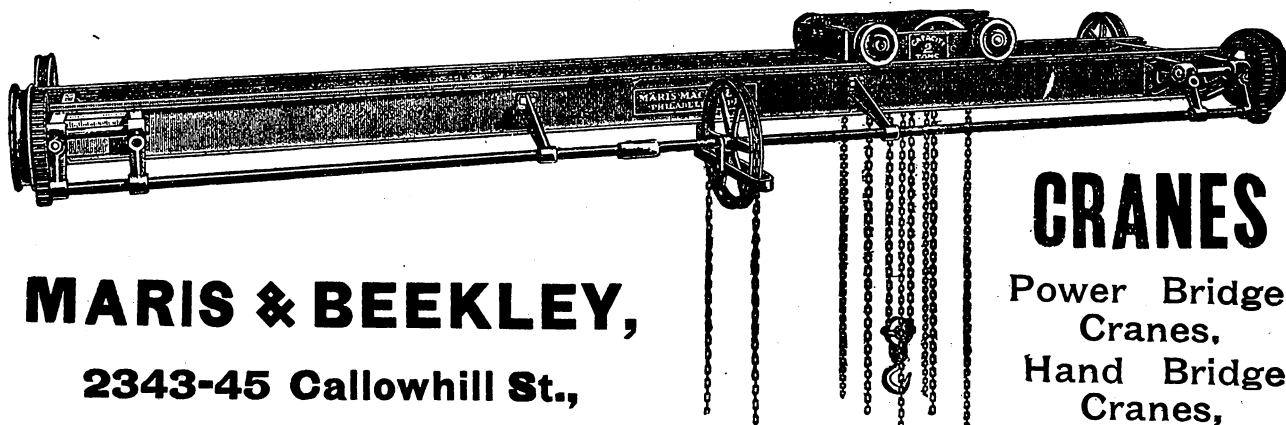
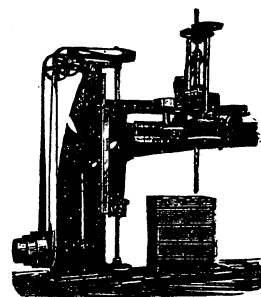
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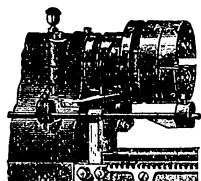
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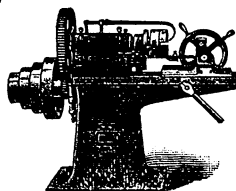
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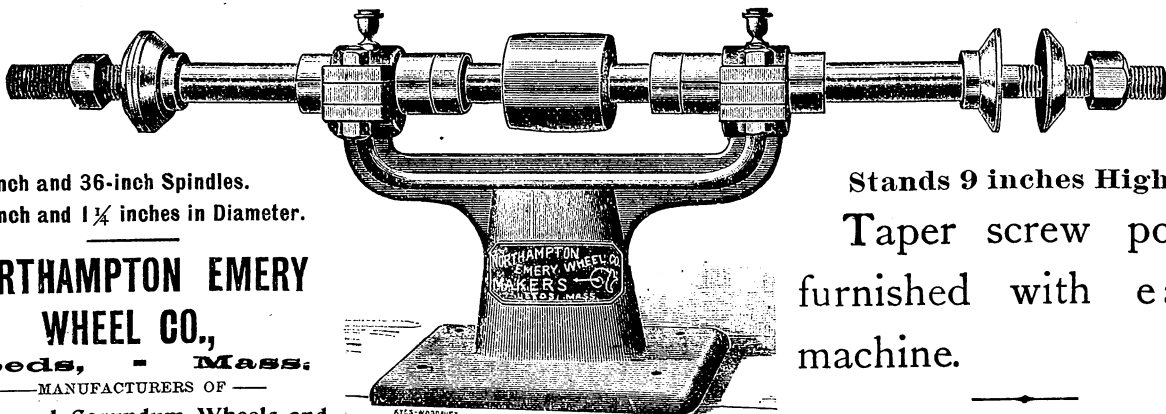
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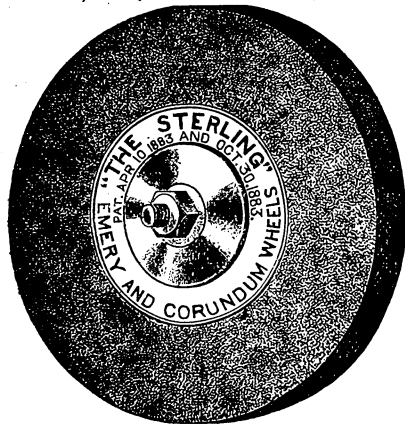


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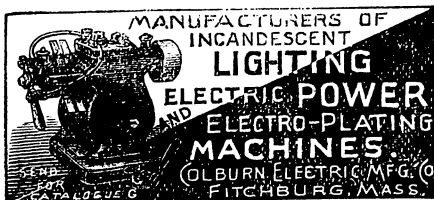
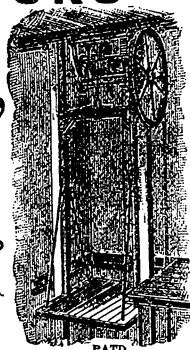
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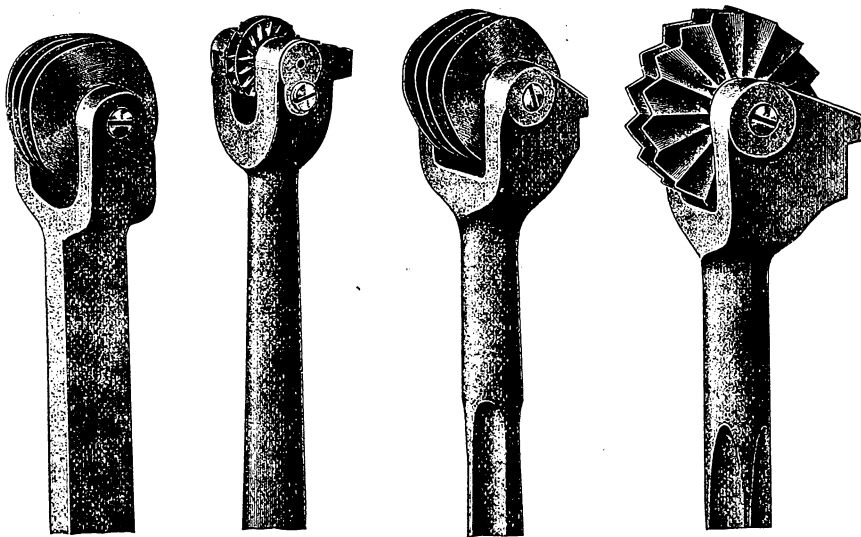
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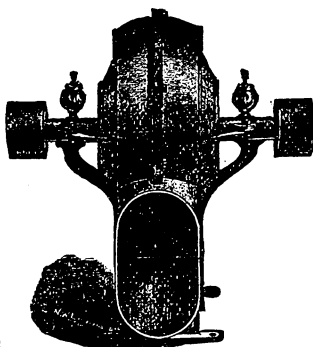


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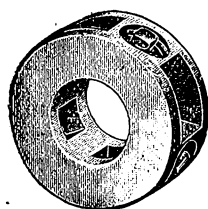
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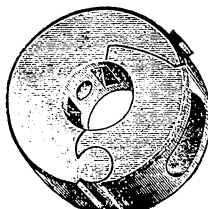


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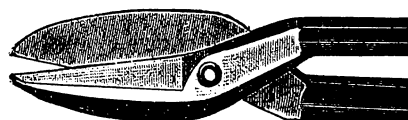
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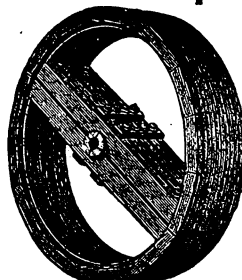
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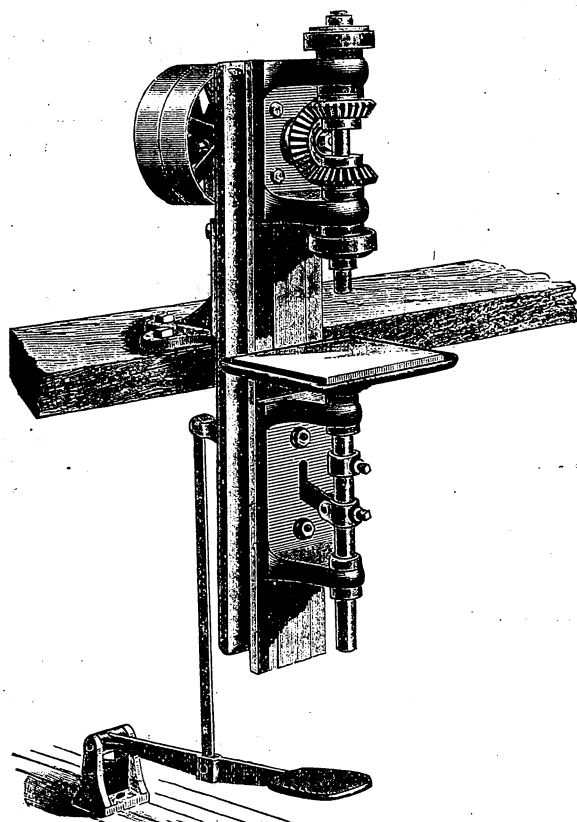
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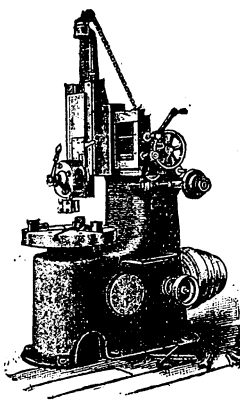
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on the premises of said Company, situated in Oxford Township, Warren County, New Jersey, a little east of the public road leading from Oxford Furnace to Belvidere (about one mile from Oxford, two miles from Belvidere and two miles from Buttsville), all that exceedingly valuable Mineral Lease, comprising 122 acres, having 25 years yet to run and including purchase privilege at any time during said term, thus canceling the royalty of 30 cts. per ton, together with the complete mining outfit, Machinery, Buildings, &c. The broad-gauge Mineral Railroad extends directly into the property and connects at Buttsville with the Lehigh & Hudson River R. R., which connects with the Del., Lack. & Western and the Pennsylvania R. R. within short distances—1½ and 3 miles.

The machinery includes one 83-horse-power boiler, one 37-horse-power boiler, one 20-horse-power boiler, two Munday hoisting engines, one with double drum, two ore washers, 6-horse-power vertical engine, 12-horse-power horizontal engine, four steam pumps, railroad siding, lot of piping, valves, fittings, and all the usual appurtenances of a well equipped mining property.

The Champion mines produce a superior grade of Bessemer steel ore averaging 65% metal, and may be worked very profitably. The 12-foot solid ore vein alone, when reached and fully opened, should yield not less than 200 tons daily. There will also be sold about 200 tons of Bessemer ore, about 65% metallic iron. Also about 500 tons of tailings, running about 47% metal. Remember the lease is an exceptionally valuable one, covering and controlling as it does all the rich deposits and veins of ore underlying to great depth perhaps the 122 acres of mineral land. The Bethlehem Iron Co. have tested and used nearly 7000 tons of the Champion steel ore while the development work was being prosecuted.

Any one wishing to examine the property before or on the day of sale will find J. R. Eckmeyer, Superintendent, a responsible man, in charge, who will give all information needed.

JOSEPH R. ENCKE, Receiver,  
P. O. Address, Trenton, N. J.

## MAP OF THE UNITED STATES.

A large handsome map of the United States mounted and suitable for office or home use, is issued by the Burlington Route. Copies will be mailed to any address (mentioning *The Iron Age*) on receipt of fifteen cents in postage by P. S. EUSTIS, Gen'l Pass. Agent, C., B. & Q. R. R., Chicago, Ill.

## Collections?

**ATTENTION!** Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Send for our draft book.

**THE HARDWARE BOARD OF TRADE, Ltd.**  
4 and 6 Warren Street, New York.  
JAS. H. GOLDEY, Treas.

**EUGENE V. N. BISSELL, Auctioneer.**  
**E. BISSELL, SON & CO.,**

Successors to

HAYDOCK &amp; BISSELL,

WHOLESALE

HARDWARE AUCTIONEERS,

19 Murray St. and 15 Park Place, N. Y.  
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

## A CHANCE.

Our goods are well known and we have a strong hold in the hardware and carriage hardware trade. Our representative is thoroughly acquainted and wants an additional line to handle. Address

"STRONG HOLD,"

office of *The Iron Age*, 96-102 Reade St., N. Y.

**AN OLD ESTABLISHED** hardware house in New York, whose salesmen cover the entire United States, wants the sole agency of American manufacturers of Chains, Toilet Clippers, Locks, Files, Carpenters' Tools and similar articles. Address

"W. B. G.," No. 105,

office of *The Iron Age*, 96-102 Reade St., New York.

## 100 CITIES AND TOWNS WANTING INDUSTRIES

Is the title of a pamphlet issued by the Illinois Central R. Co. If you are thinking of making a change in location and are not well informed as to the advantages of locating either in the West or South, write for a copy. If you want in a nutshell the

## SALIENT POINTS OF OVER 100 PLACES

on the line of the Illinois Central and Yazoo & Mississippi Valley Railroads, giving the population, city and county, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries desired, etc., apply to the undersigned. Our line is in the shape of the figure "7" and runs from Sioux Falls, S. D., and Sioux City, Ia., to New Orleans, passing through South Dakota, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and has

## NEARLY EVERY KIND OF RAW MATERIAL

used in manufacturing, together with populous sections which are large consumers of the manufactured product. To sound industries which will bear investigation, substantial inducements will be given by many of our places, and they will be welcomed heartily by the different sections traversed by the Illinois Central and Yazoo & Mississippi Valley Railroads. For all information on the subject, address

GEO. C. POWER,

Industrial Commissioner I. C. R. R., Central Station, Chicago, Ill.

## From the World's Fair Buildings.

### SECOND-HAND

**I Beams,  
Channels,  
Z Bars,  
Angles  
Trusses,  
Girders.**

**Bolts, Nuts, Rivets &c.,**

Also about 275,000 ft. second-hand Lumber, Timber, Joist, Flooring, &c. For particulars, prices, &c., address

**C. H. SIBELL & CO.,**  
218 La Salle St., Chicago.

## Mill and Factory Property at Auction.

It is often advisable or necessary to sell Mill and Factory Property at Public Auction. We take entire charge of Auction Sales of Manufacturing Property, both Real Estate and plant, in all parts of the country. For OWNERS, RECEIVERS, ASSIGNEES and ADMINISTRATORS. Particulars on application.

**E. DE FOREST SHELTON & CO.,**  
SPECIALISTS MANUFACTURING PROPERTY,  
Stewart Building, 280 Broadway, New York City.  
Mill and Factory Property Negotiated.

## For Sale or Lease.

### TO CLOSE AN ESTATE.

**Bloomfield, NEW JERSEY.**

Brass Rolling Mill and Factory Buildings. Fully equipped and in good condition. Price low. Payments easy. Apply on the premises or to

**JOHN M. GWINNELL,**  
Newark, N. J.

Care of Estate of P. Hayden.

## EXECUTOR'S SALE

of Hardware, Plumbing and Metal Working business to close estate of late James G. Burt. Business established twenty years. Stock and fixtures \$20,000 to \$25,000. A rare opportunity for investment in paying business in "Sunny California." Address

**D. A. MOULTON, Executor,**  
San Bernardino, Cal.

## AGENCY WANTED.

By party fifteen years connected with iron and brass foundry business as manager, selling agent and treasurer. Want to handle the product of a first-class, energetic and enterprising foundry. Can furnish all references. Can command capital. Correspondence solicited. Address

"IRON AND BRASS," No. 623,

office of *The Iron Age*, 96-102 Reade St., N. Y.

## FOR SALE.

Electric Light Plant, nearly new.  
Cost \$5000. Will sell cheap.  
1 600 Light Incandescent Dynamo.  
1 20 " Arc Dynamo.  
1 11 in. x 12 in. Westinghouse Standard Engine. Address

"V. Z.," Lock Box 1086,  
Philadelphia.

## FOR SALE.

One 15 x 24 Trenton Automatic Engine used but a short time. Good as new. Fly-wheel and Pulley 8 ft. 6 in. diameter, 18 in. face. One extra Pulley the same size. Will be sold at a bargain. Address WILSON BROS., Easton, Pa.

## Hardware, Tin and Stove Business For Sale.

Good location. Splendid opportunity. Sickness cause for selling. Address "A. T.," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

## FOR SALE. HARDWARE STOCK.

A nice clean stock that will invoice about \$4000. Located in a county seat town in Central Iowa of 2500 inhabitants. Good schools and churches, fine farm land, well established trade. Good reasons for selling, which will be explained on application. Will sell cheap for cash only. Address "CENTRAL IOWA," office of *The Iron Age*, 96-102 Reade St., New York.

**FOR SALE OR TO LEASE** on good terms, a manufacturing water power plant. Stone buildings, 1300 horse power, fully equipped with turbines, suitable for a wood pulp mill, electrolytic refining works or metal rolling mill. Advantageously situated. Address "WATER POWER," office of *The Iron Age*, 96-102 Reade St., New York.

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of about \$2500 in a good live town in Northern Indiana. Stock will be sold at a bargain. Address

**THE GEO. WORTHINGTON CO.,**  
Cleveland, Ohio.

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to represent a new first-class razor manufactory in the States west of Chicago. No one without experience in the trade and good references need apply. Answer to

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Office of *The Iron Age*, 146 Franklin Street, Boston, Mass.

## ADOLPH BUTZE,

Manufacturers' Agent.

**Railroad, Packing House and Contractors' Supplies.**

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**LATROBE STEEL WORKS, Locomotive and Car Wheel Tires. UNITED RUBBER CO., Hose, Packing, &c. GEO. GRIFFITHS CO., Shovels, Scoops, &c. Corrugated Galvanized and Sheet Iron, Plate, Tank and Bar Iron, Waste—White, Colored and Wool.**

Bank of Commerce Bldg. St. Louis, Mo.

## NOW is the time to INVEST in SOUTHERN TIMBER- MINERAL LANDS,

Before prices advance. All kinds of mines for sale.

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Terms Easy. CINCINNATI, O. Titles Perfect.

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BUILDERS OF

## Harris Corliss Engines,

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**Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.**

**SELLING AGENCY WANTED**, for blast furnace and iron and steel works products, by a gentleman having extensive acquaintance among railroads, foundries and shops. Address "AGENT," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

*If advertising absorbs any of your "principal," it presumably enlists to some extent your "interest" also. Do you feel quite certain that the betterment of your various advertising ventures in their matter, manner (or person) extended, without a prolonged interest in advertisement Post, for "Circular No. 281," and simply ask you need not be reminded to open any correspondence Card, there you write, please two cents in*

*place of one.*  
*This "Circular," No. 9, costing you nothing, is at least worth so much.*

96-102 READE ST., NEW YORK.



# IMPROVED EDITION OF THE IRON AGE HARDWARE PRICE BOOKS.

Arranged by R. R. WILLIAMS, Hardware Editor of the Iron Age.

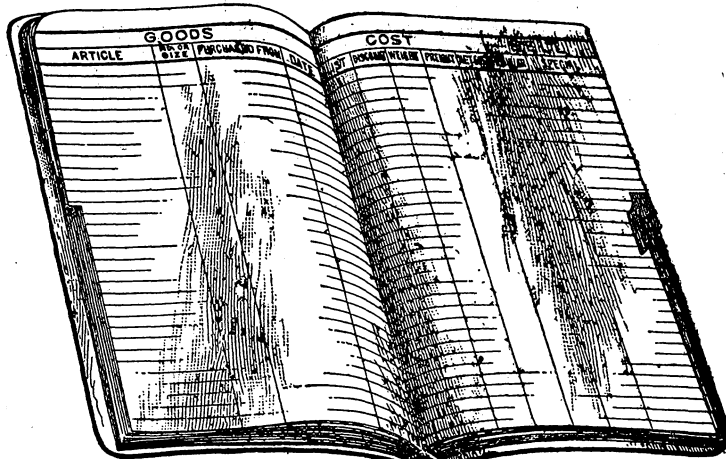
These Books are printed on paper of superior quality and bound in grain seal leather.

Columns are provided for the name and number or size, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses as an element of cost. Under the heading of selling prices, the regular and any special price, or remarks in regard to the goods are given place. This book goes into considerable detail in describing the goods and cost prices. It has been arranged in accordance with the views of many Hardwaremen whose methods are careful and exact.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

A, 200 pages,	-	-	-	-	\$1.00
A F, 200 pages with flap,	-	-	-	-	1.25
A 2, 400 pages,	-	-	-	-	1.50
A F 2, 400 pages with flap,	-	-	-	-	1.75



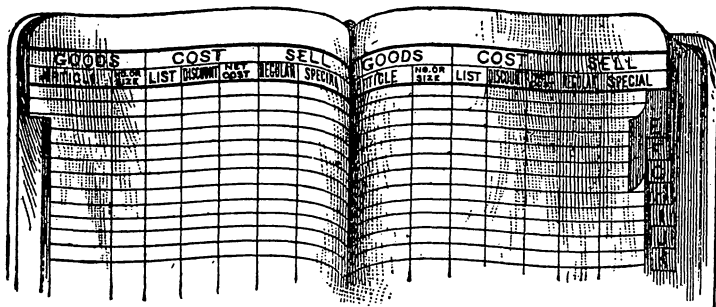
Hardware Price Book A.

In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

Size, 4 x 7 in.; grain seal leather.

FOUR EDITIONS:

B, 200 pages	-	-	-	-	\$1.00
B F, 200 pages with flap,	-	-	-	-	1.25
B 2, 400 pages,	-	-	-	-	1.50
B F 2, 400 pages with flap,	-	-	-	-	1.75



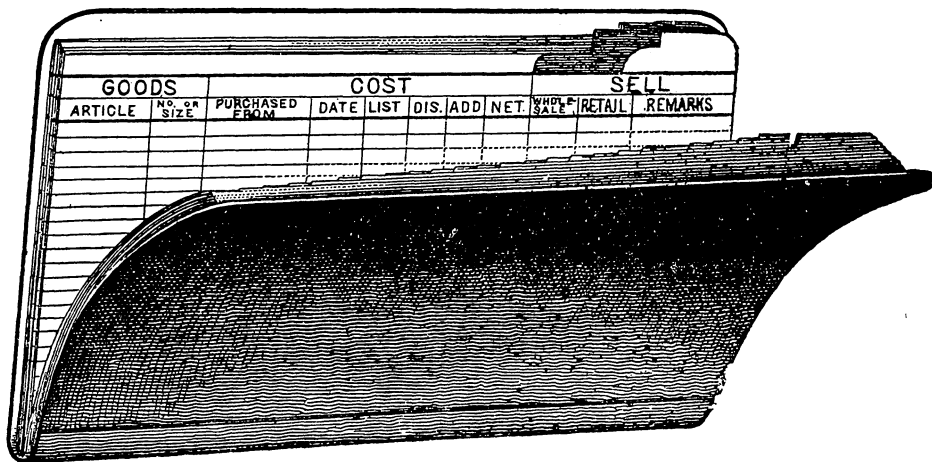
Hardware Price Book B.

The headings in Book C run across the top, in a line parallel with the hinge. In this way a very complete record can be kept on a single page. The details of weight and freight contained in Book A are omitted, and a single column headed "Add" given for the insertion of freight or other expenses which it is desirable to include in the cost. Under the selling prices space is left for the wholesale price, the retail price, and also for any remarks in regard to cost of the goods, desirability of pushing them, or other matters.

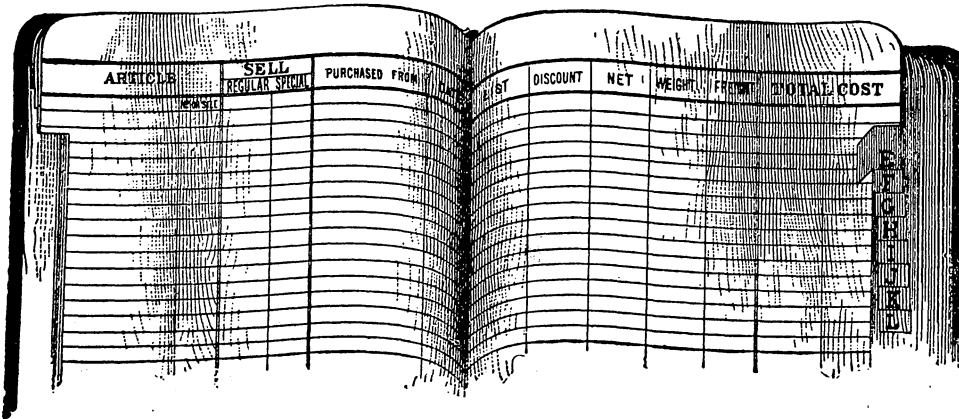
Size, 4½ x 7½ in.; grain seal leather.

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C, 200 pages,	-	-	\$1.00
C F, 200 pages with flap,	-	-	1.25
C 2, 400 pages,	-	-	1.50
C F 2, 400 pages with flap,	-	-	1.75



Hardware Price Book C.



Hardware Price Book D.

Price Book D will recommend itself particularly for desk and store use, and for salesmen on the road.

The name of the article, its number or size and the selling price are the first to meet the eye on the left-hand page, as embodying information desired when the selling price is required. The other headings follow in convenient order, by which a detailed memorandum regarding the goods may be kept, the whole being seen at a glance. A number of pages at the back of the book are arranged for memoranda, which will be found a great convenience. This ar-

angement is adapted to the requirements of the trade in this direction.

Size 5½ x 8 in.; grain seal leather.

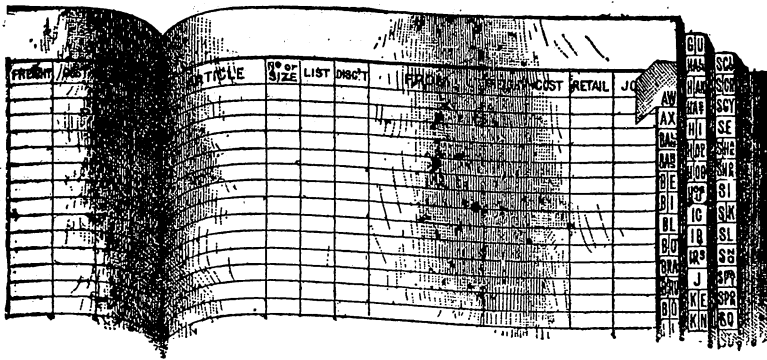
FOUR EDITIONS.	D, 200 pages,	-	-	-	\$2.00
	D F, 200 pages, with flap,	-	-	-	2.50
	D 2, 400 pages,	-	-	-	\$3.00
	D F 2, 400 pages, with flap,	-	-	-	3.50

Sent, post-paid, on receipt of price by **DAVID WILLIAMS, Publisher, 96-102 Reade St., New York.**



# The Iron Age Hardware Price Book E.

SECOND EDITION, REVISED AND ENLARGED, WITH MULTIPLE INDEX (Patent Pending).



AD GU SC  
AN HA SCR  
AU HAN SCY  
AW HA SE  
AX HI SH  
BA HO SH  
BA HOO SI  
BE HO SK

*Fac-Simile of Indexing.*

**SIZE.**—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

**PAPER.**—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

**BINDING.**—The binding is of the very best quality—flexible seal grained leather.

**INDEX.**—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

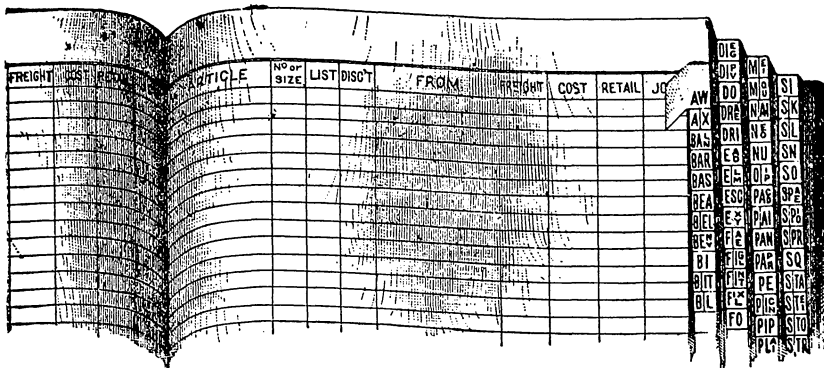
**ARRANGEMENT.**—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

**SUPPLEMENT.**—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.**

# The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD DI MF SI  
AN DI MQ SK  
AU DO NAI SL  
AW DR NF SN  
AX DRI NU SO  
BA E O SP  
BAR EM PA SP  
BAS ESC PAI SPR

*Fac-Simile of Indexing.*

**SIZE.**—The book is 8 1/4 x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

**PAPER.**—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

**BINDING.**—The binding is of the very best quality—flexible seal grained leather.

**INDEX.**—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

**ARRANGEMENT.**—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

**SUPPLEMENT.**—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

**THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.**

## Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to	AU	For Chisels,	turn to	CH	For Iron,	turn to	IRO
" Parers, Apple	"	PA	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH
" Pumps,	"	PUM	" Rules,	"	RUL	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

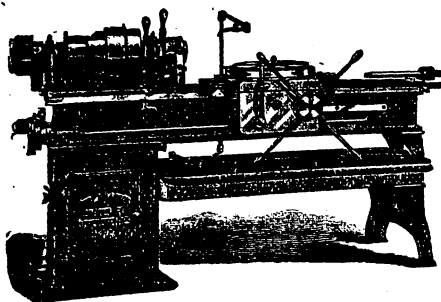
**Hardware Classification.**—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

**Standard Lists.**—In connection with these price books a set of *The Iron Age* STANDARD HARDWARE LISTS can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

Sent, Post-paid, on Receipt of Price, by

DAVID WILLIAMS, Publisher, - 96-102 Reade St., New York.



HAVE YOU A

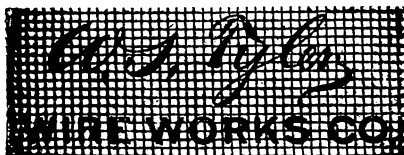
## FLAT TURRET LATHE ?

If not send for

## RAPID LATHE WORK.

JONES & LAMSON MACHINE CO.,

SPRINGFIELD, VT., U. S. A.



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PRINTED PRICE-LISTS ON APPLICATION.

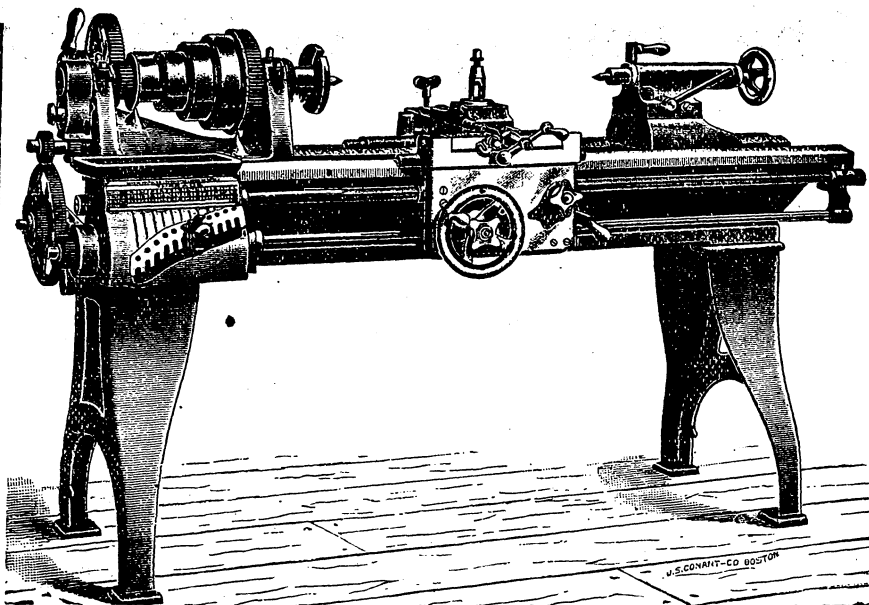
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The Pittsburgh Reduction Co.,

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Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

ALUMINUM SHEET, WIRE,  
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The Hendey Machine Co., Torrington, Conn.

A NEW FEATURE IN SCREW CUTTING ENGINE LATHES. THE HENDEY-NORTON LATHE.

This lathe cuts 12 different screws, from 6 to 20, without changing the gears, and feed changes from 36 to 120 cuts per inch without change. This cut shows a 14-inch x 6-foot Lathe. It has hollow spindle, 1-inch. Has compound or elevating rest, as preferred, or the double carriage rise and fall rest. Also taper attachment if desired. The carriage reverses for screw cutting without the use of the countershaft, from the lever at the end of carriage, allowing the spindle to run in one continuous direction. In stock for immediate delivery, 14-inch, 16-inch and 18-inch, 20-inch and 30-inch in the works. Send for descriptive catalogue.

CHAS. CHURCHILL, Ltd., London, England,  
SCHUCHARDT & SCHUTTE Berlin, Germany, } AGENTS.  
EUGENE SOLLER, Basel, Switzerland,

The Hendey Machine Co., - Torrington, Conn.

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Containing complete instructions for Designing, Drawing, and Constructing Spur Wheels, Bevel Wheels, Lantern Gear, Screw Gear, Worms, &c. and the proper formation of Tooth Profiles. For the use of Machinists, Pattern Makers, Draughtsmen, Designers, Scientific Schools, &c. With many plates. By J. Howard Cromwell. 12mo, cloth. \$1.50.

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MODEL A - - \$125.  
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MODEL E - - 85.

MODEL B - - \$100.  
LADIES' F - - 100.  
LADIES' D - - 85.

Each Model the best value at its price. Six Thousand Riders of our 1894 machines can testify to their excellent qualities. Liberal prices to the Hardware trade.

S. A. HAINES, Indianapolis, Ind., Selling Agent to Hardware Jobbers.

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THE  
BEST  
FREEZER.

Heavy Waterproof Tubs. Cans of Charcoal Tin-plate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered.

THE  
BEST  
SELLER.

The White Mountain Freezer Co., Nashua, N. H.

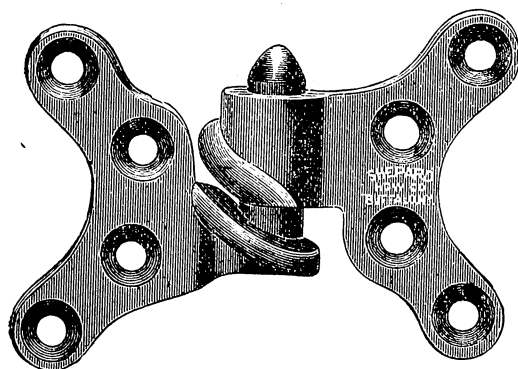


The true test of a Freezer is how well it performs its work; in this respect the unsolicited testimony of thousands pronounce the "Packer Freezers" unexcelled.

**GOOD LUCK, STANDARD,  
AND CONFECTIONERS' MACHINE FREEZERS.**

The "Good Luck" is the latest and best low price Freezer on the market. Inside Castings Tinned, Malleable Iron Fittings, Automatic Scraper. White Cedar Pails with Galvanized Steel Hoops. Pine Pails, or Wire Rings with bottom of pail unprotected are not used.

CHAS. W. PACKER, Mfr., 20 N. Fourth St., Philadelphia.



St. Louis Gate Hinge. (Lower Hinge.)

**Gate Hinges  
and Latches,  
BLIND AND SHUTTER HINGES  
And FRAME PULLEYS**

OF THE

Original "Clark" and other patterns formerly sold by  
THE SHEPARD HDW. CO. of Buffalo,  
whose business in these lines we have  
acquired by purchase.

Manufactured only by.

The WRIGHTSVILLE HARDWARE CO.,  
WRIGHTSVILLE, PA.



**Gem Ice Shave.**

For shaving ice from blocks without removing from refrigerator. Shaved ice is required for cooking cantaloupes, melons, tomatoes, and other fruit, for oysters and clams on half shell, for cooling wines, liquors, lemonades, iced drinks, for use at soda fountains, bar rooms, restaurants, etc.

List Price, \$6.00 per dozen, less discount.

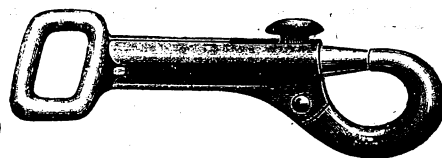
**CROWN ICE CHIPPER.**

The only simple, effective and cheap tool for chipping ice to use in freezers in place of old-time bag and hatchet. Reduces ice quickly to small uniform pieces, size of peanuts. Used with great advantage to chip ice for soda fountains, bar rooms, restaurants, etc.

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## COVERT'S BANNER BOLT SNAP.



This snap has many important advantages over other makes of Bolt Snaps, viz: It is lighter, the spring is entirely covered and protected from foreign substances and freezing, and is lower in price.

Made in all sizes: Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

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FARMER, N. Y., U. S. A.

Hardware Dealers  
Can Profitably  
SELL BICYCLES.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

## COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,  
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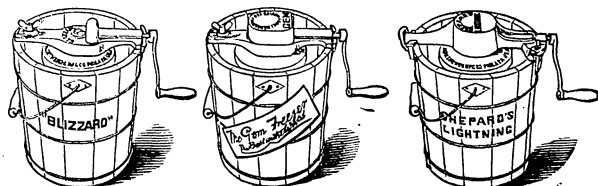
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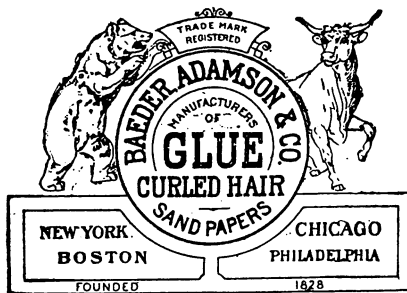
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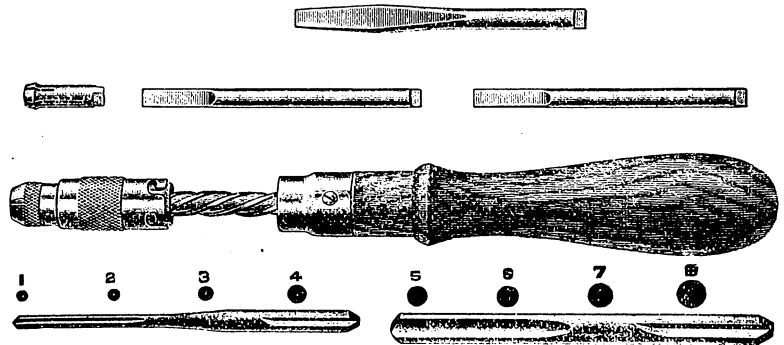


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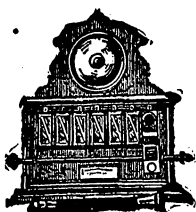
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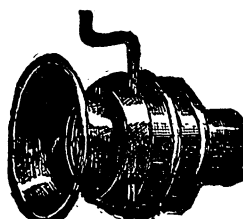
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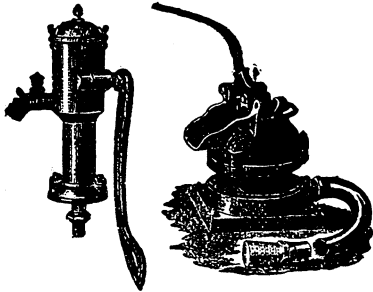
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Fig. 209.

Fig. 381.

Fig. 145.



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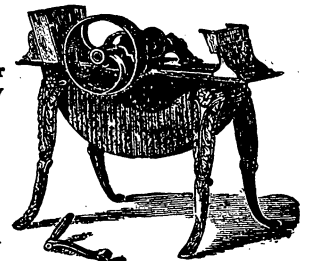
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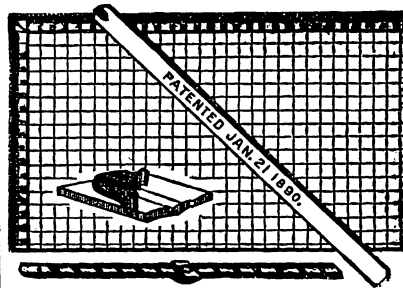
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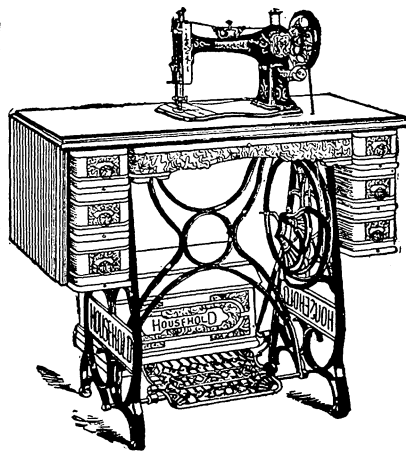
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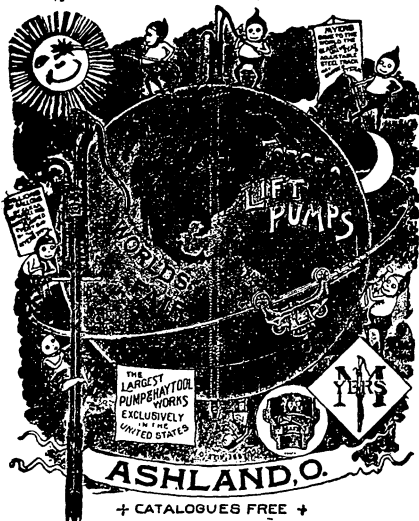
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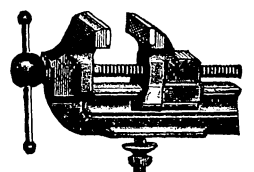
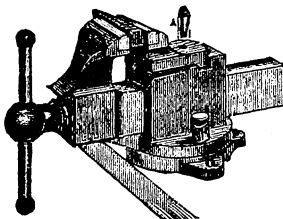
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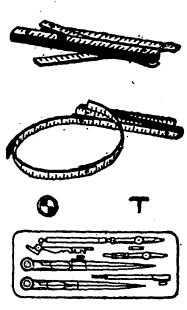


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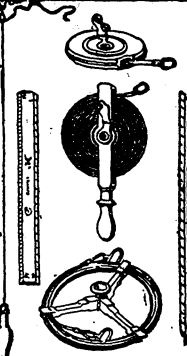
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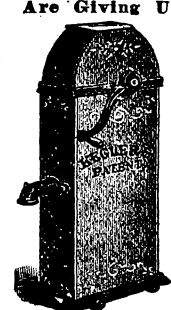
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"GALVANIZED IRON  
TUBING and CURB,  
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CHAIN PUMPS,  
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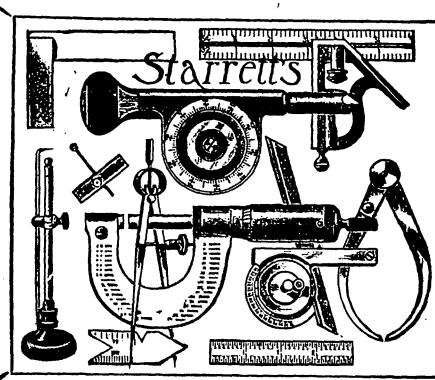
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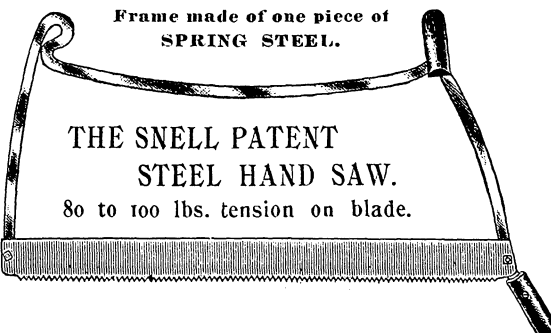
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80 to 100 lbs. tension on blade.

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Prevent all vibration and render Saw Filing noiseless.  
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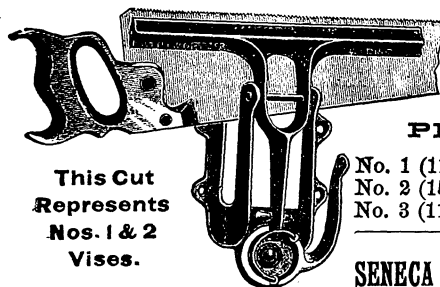
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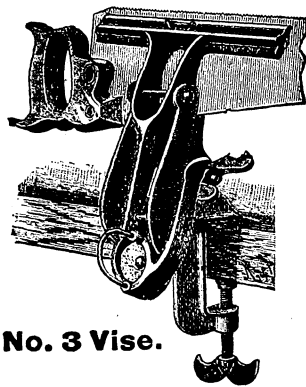
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WITH DOUBLE PLUMB.

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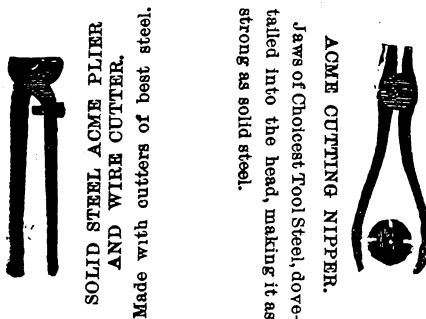
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Made with cutters of best steel.

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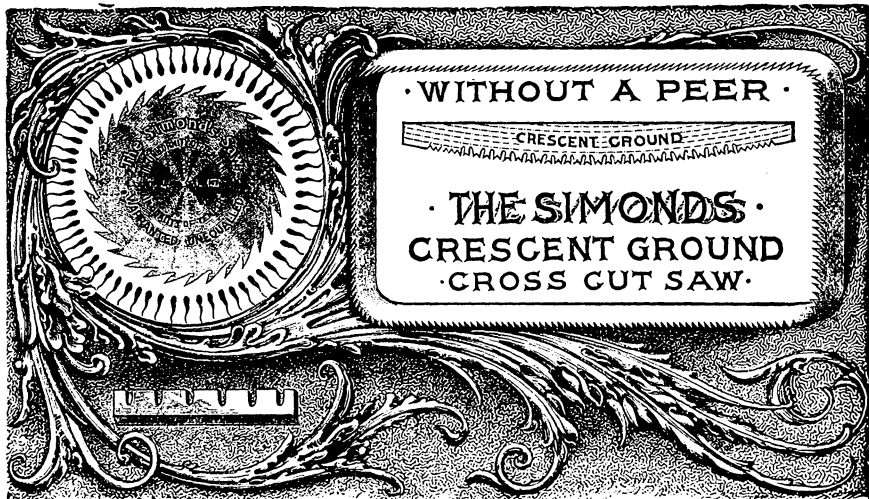
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Machine Knives, Shear Blades,  
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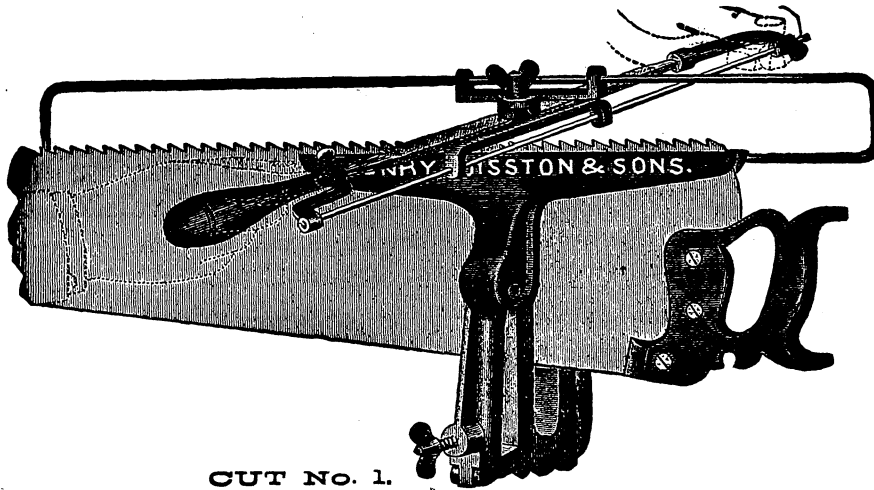
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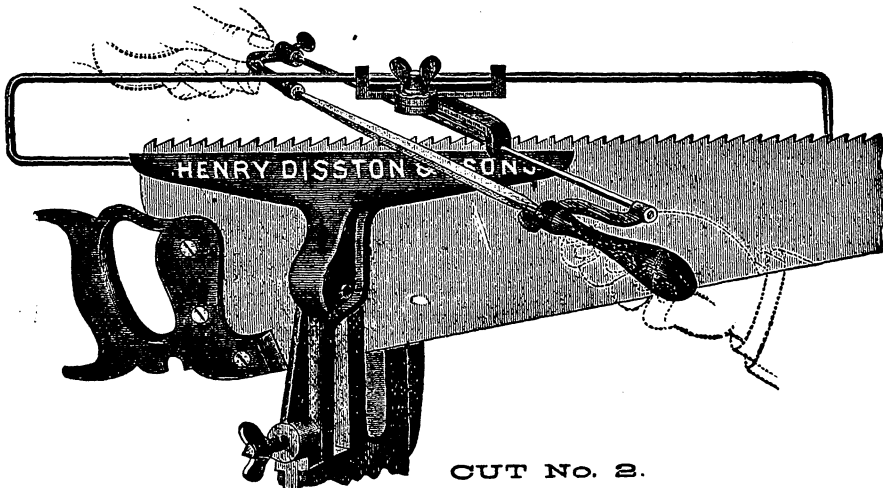
# DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART  
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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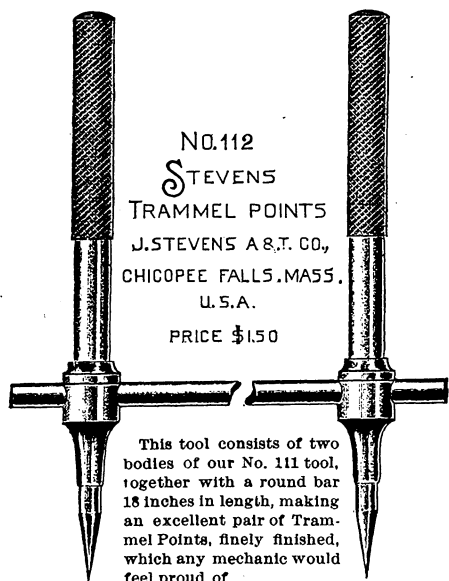
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## THE FILES THAT LEAD THEM ALL

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market.



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STEVENS  
TRAMMEL POINTS  
J. STEVENS A & T. CO.,  
CHICOPEE FALLS, MASS.  
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PRICE \$1.50

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## Stevens Tools ARE Standard.

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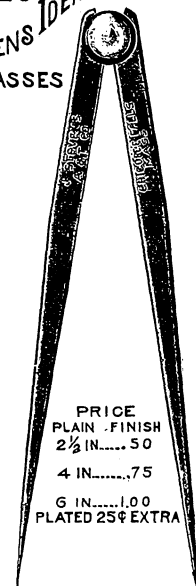
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P. O. Box 5729,

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No. 120  
STEVENS IDEAL  
COMPASSES



PRICE  
PLAIN FINISH  
2 1/2 IN. .... 50  
4 IN. .... 75  
6 IN. .... 1.00  
PLATED 25¢ EXTRA

There has been a very great demand for a tool of this description. It can be used as a spacing divider by a draughtsman or carpenter. The joint is sufficiently rigid to allow it to be used by machinists in spacing or scribing circles.

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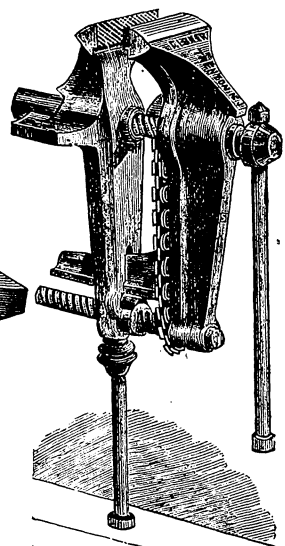
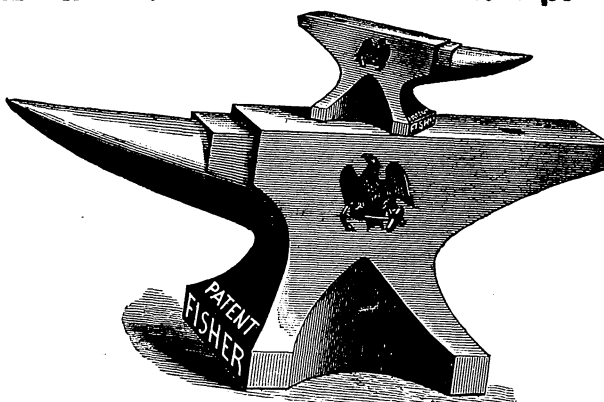
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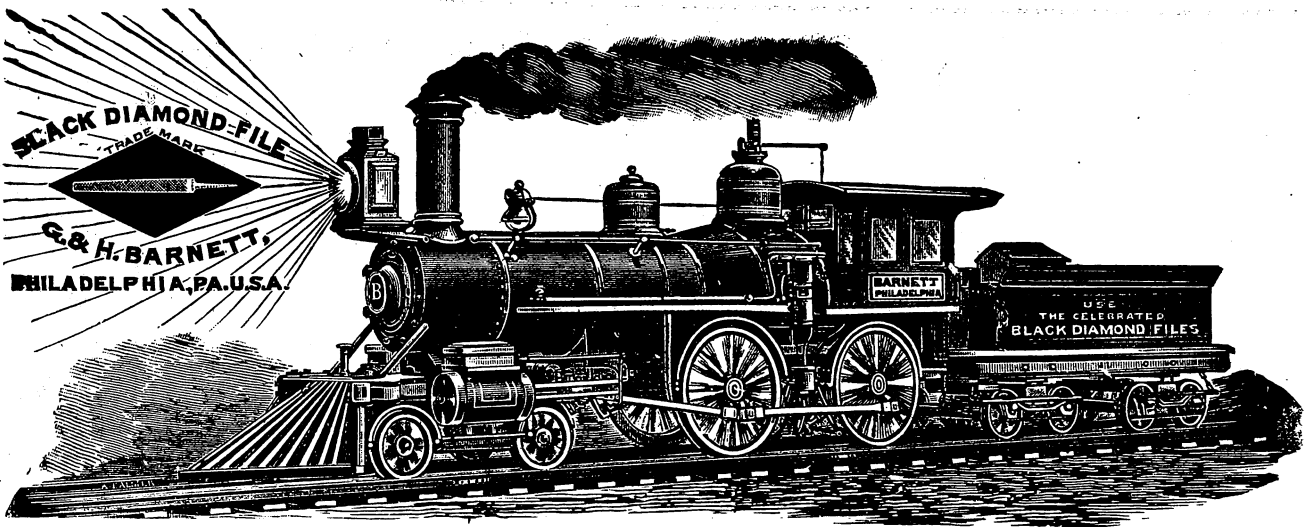
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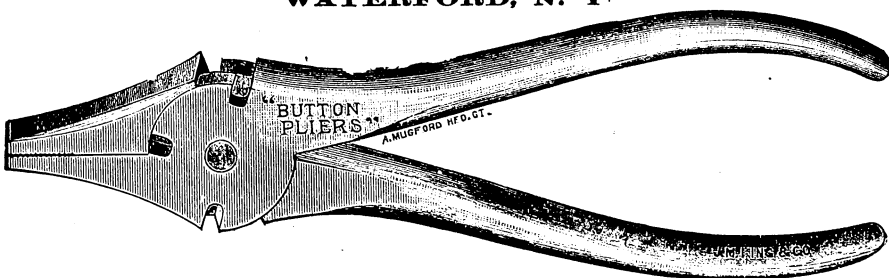
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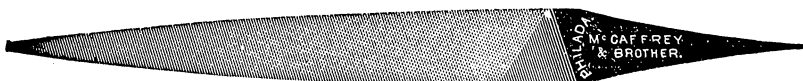
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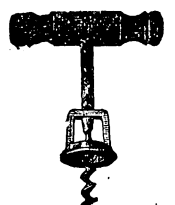
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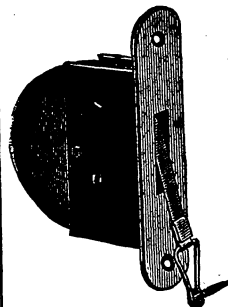
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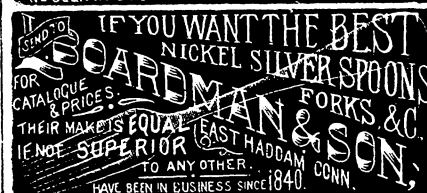


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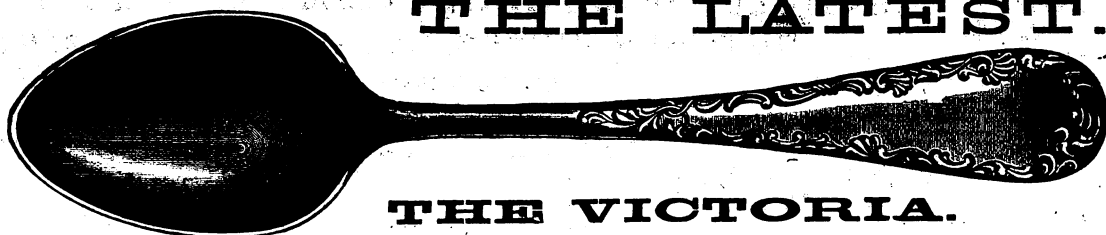
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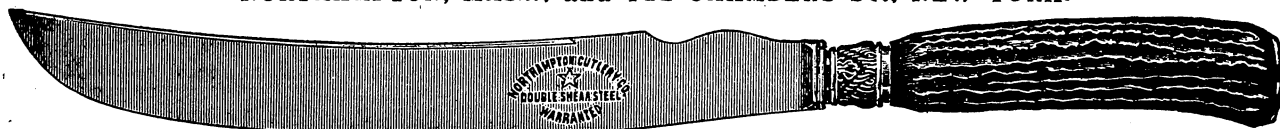
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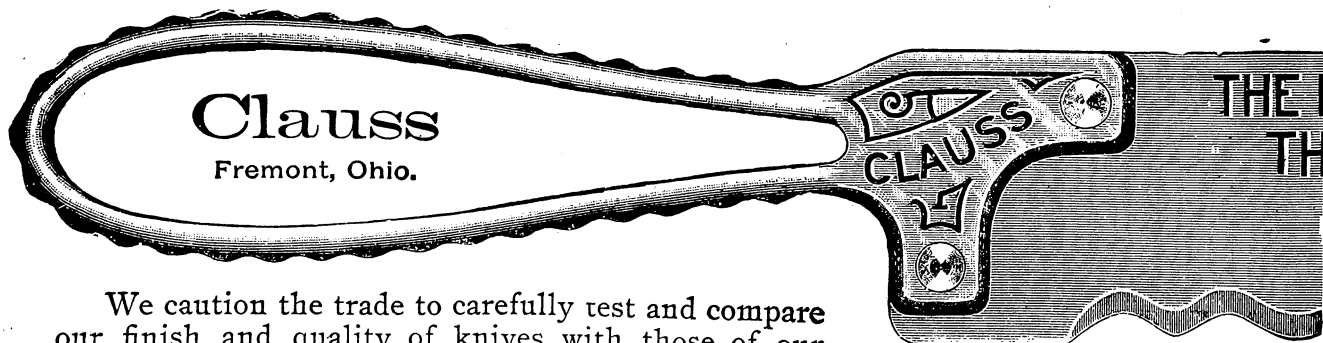
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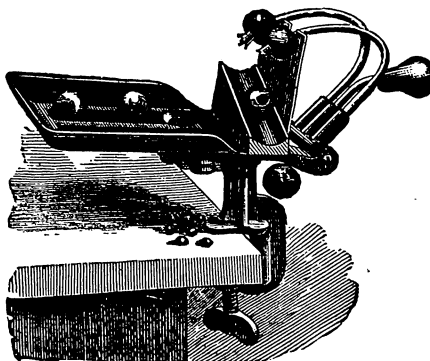
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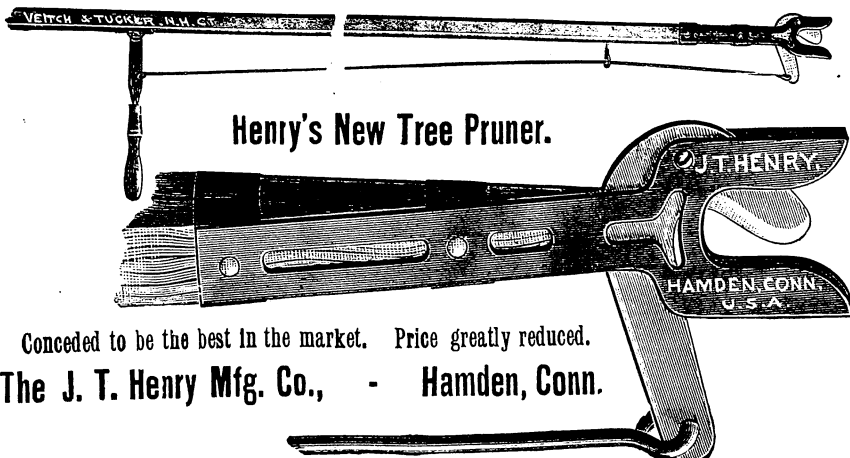
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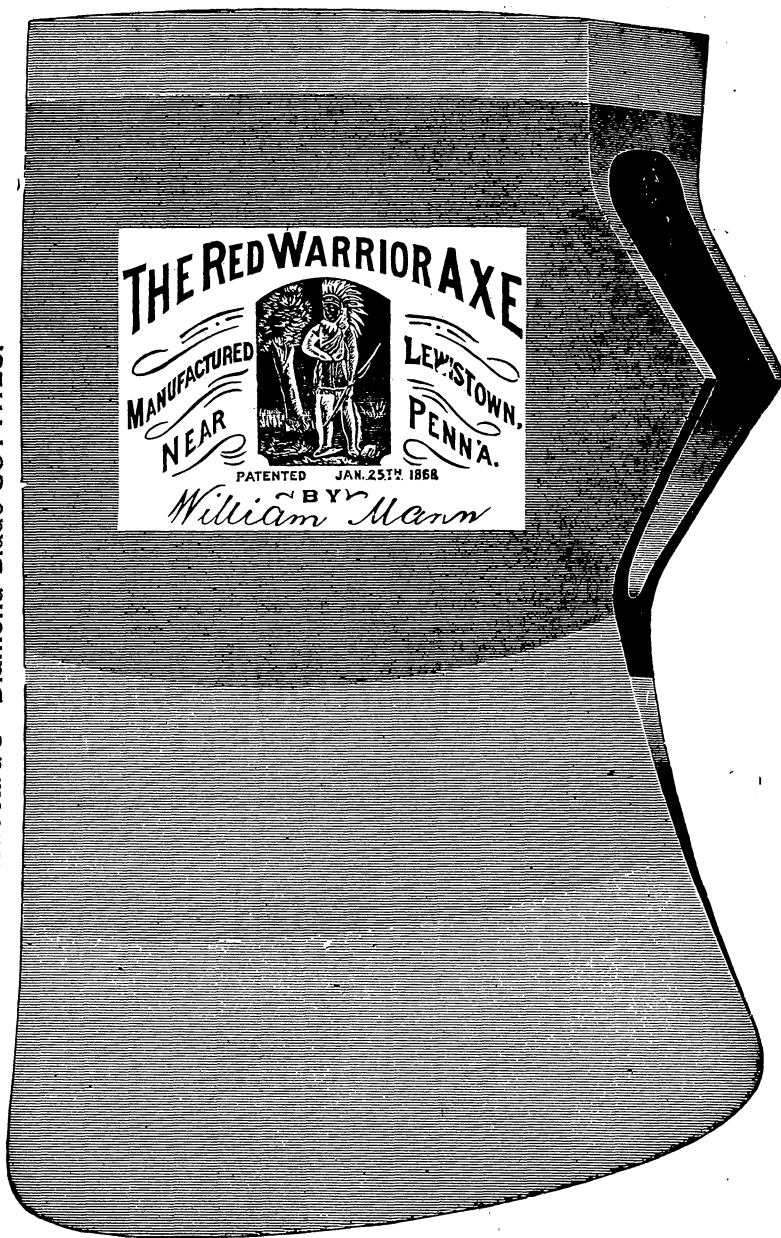
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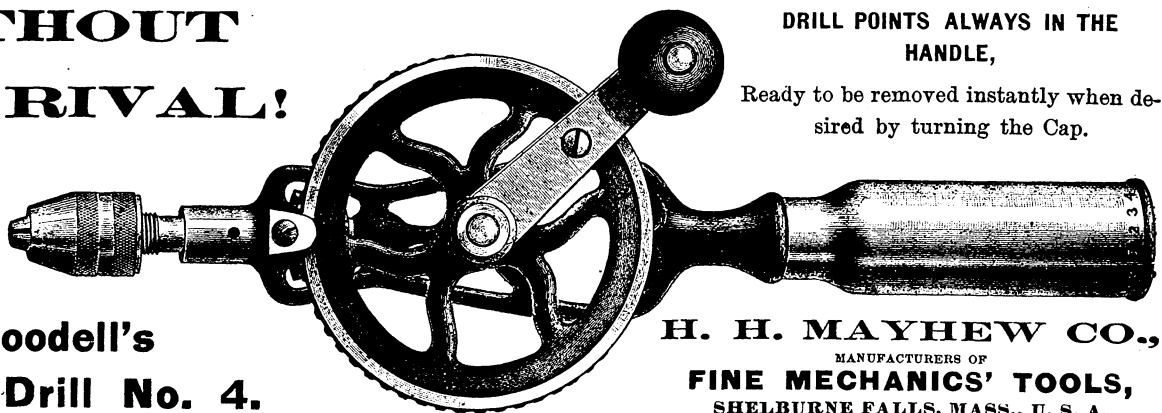
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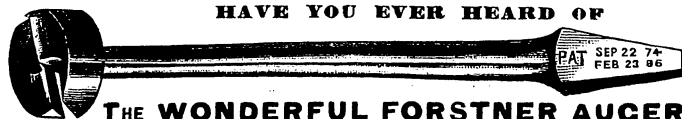
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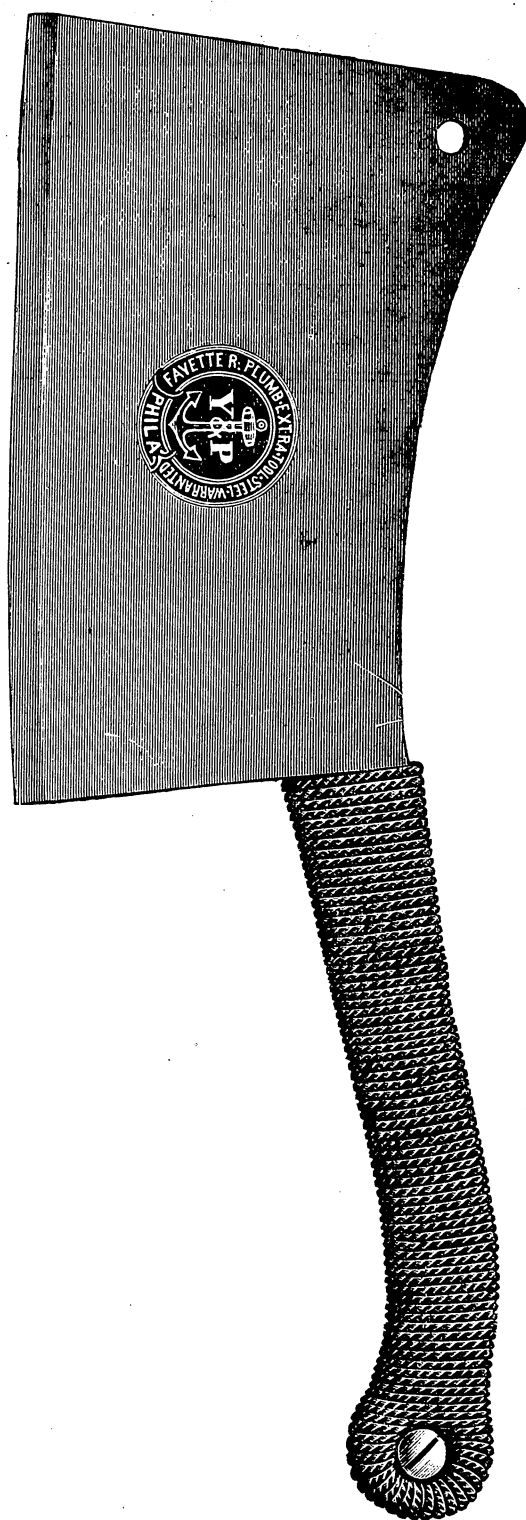
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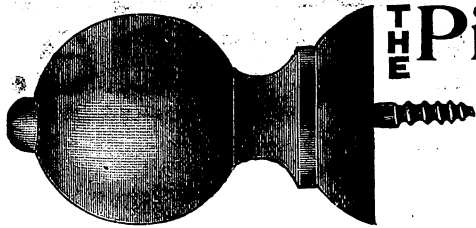
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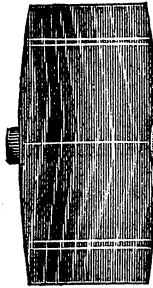
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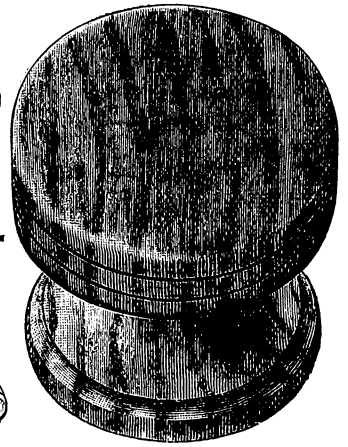
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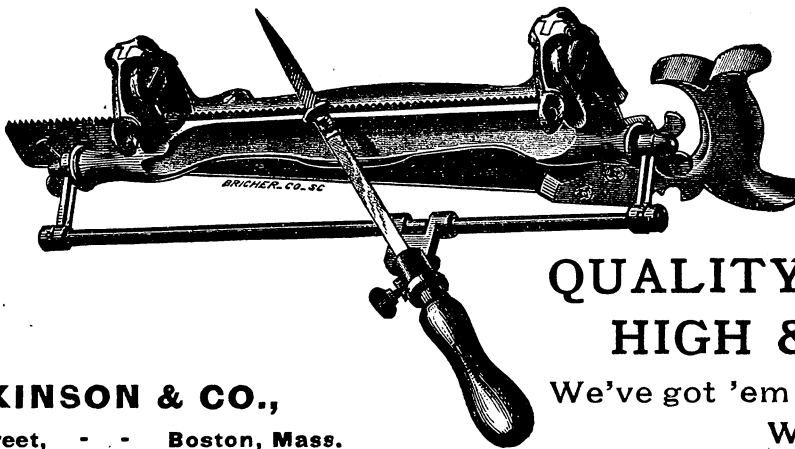
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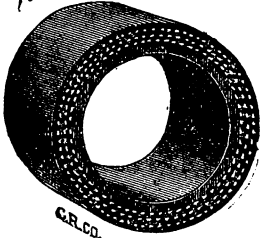
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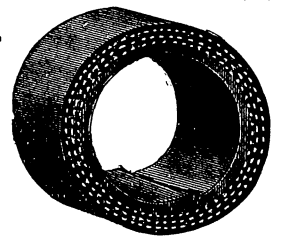
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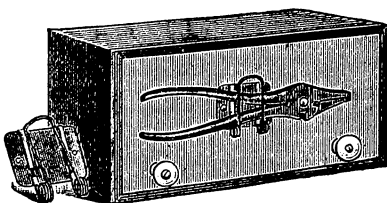
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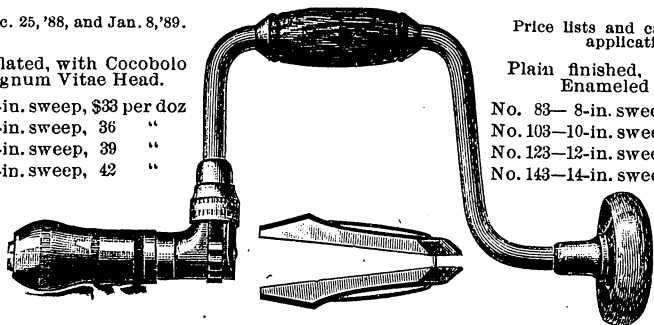
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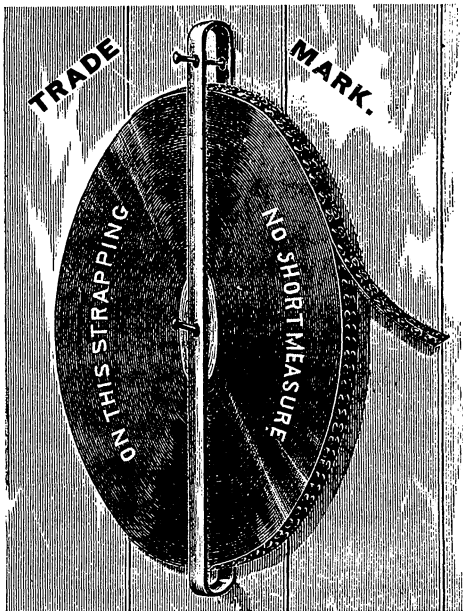
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See

*The Iron Age,*

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*Page 1210*

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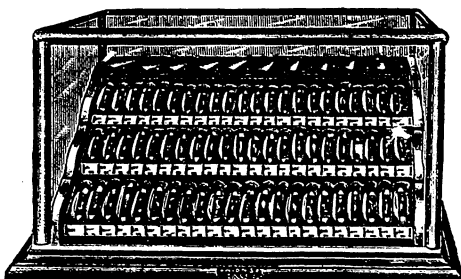


Pat. Dec. 13, 1887.

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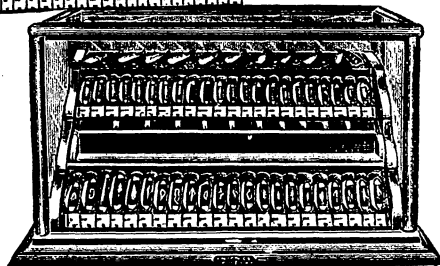
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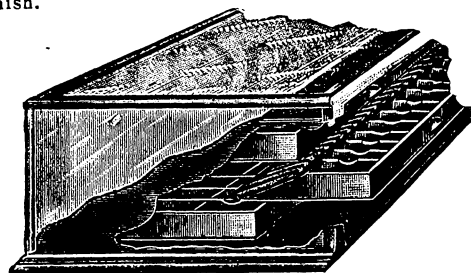


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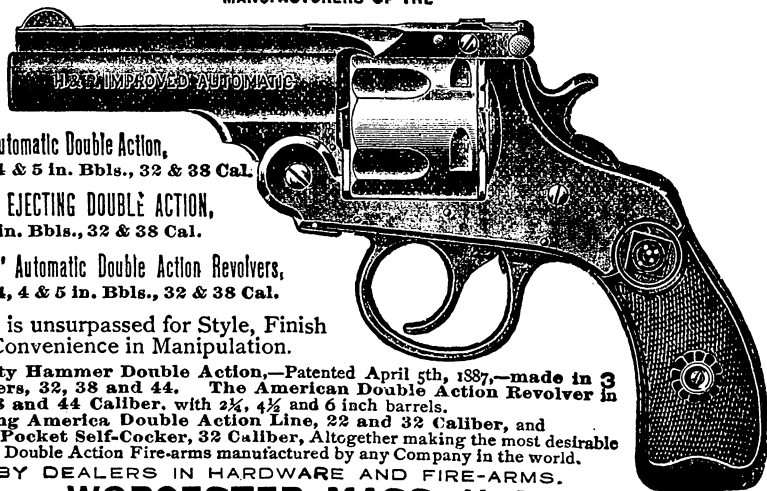
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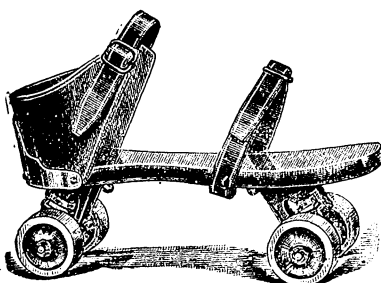
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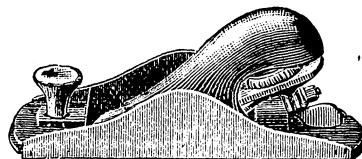
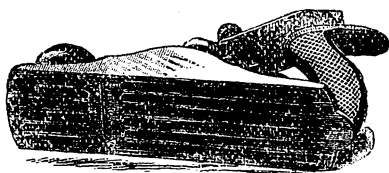


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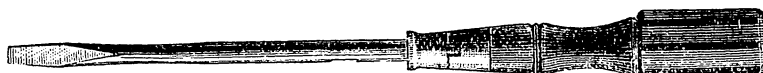
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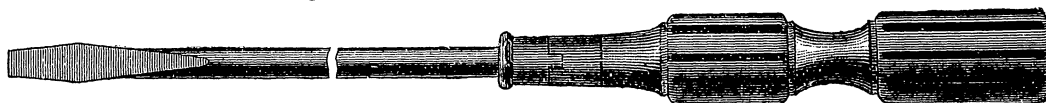
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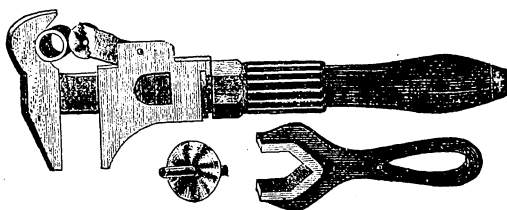


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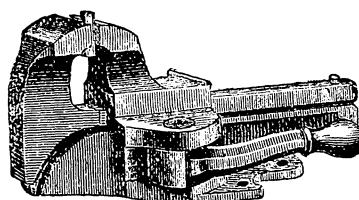


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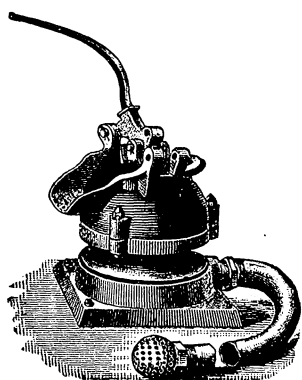
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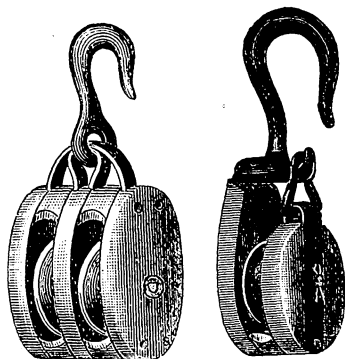
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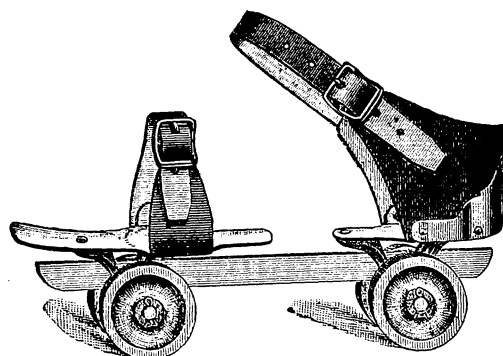


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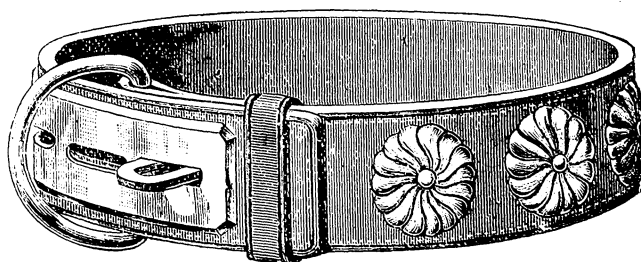
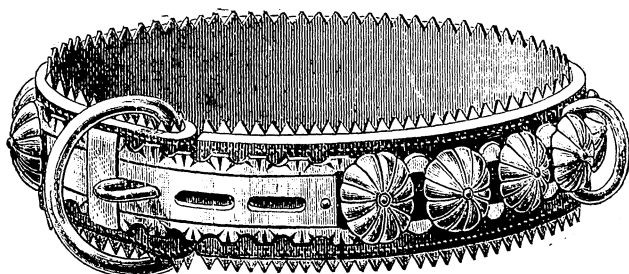


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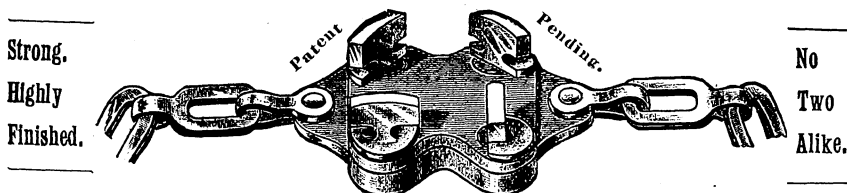
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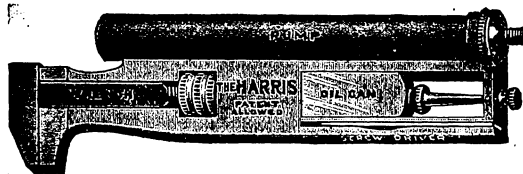
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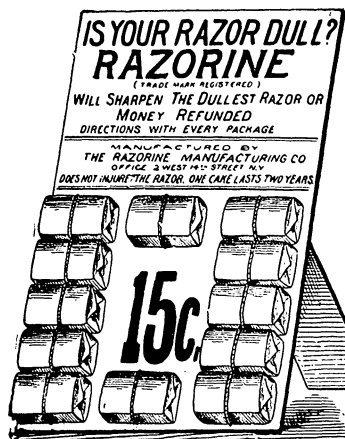
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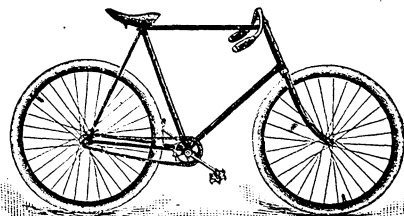
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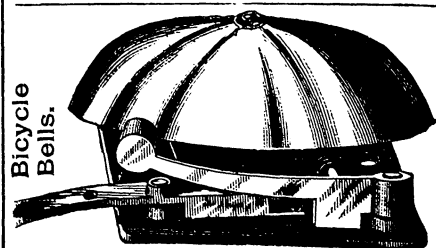
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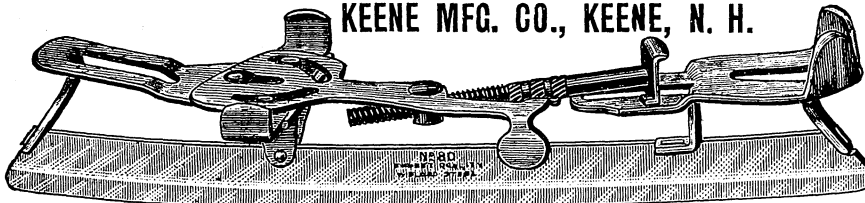
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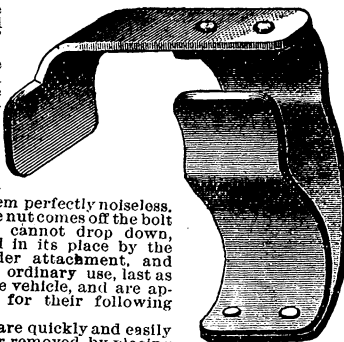
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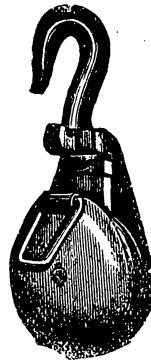
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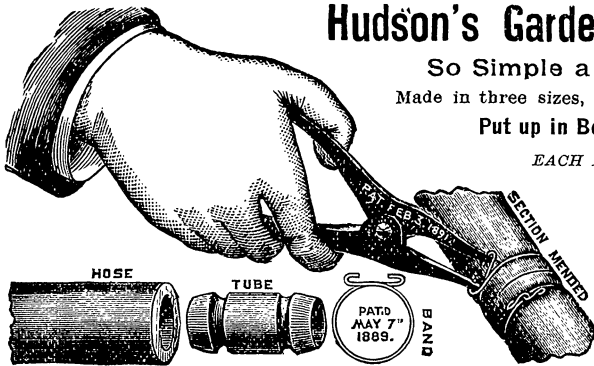
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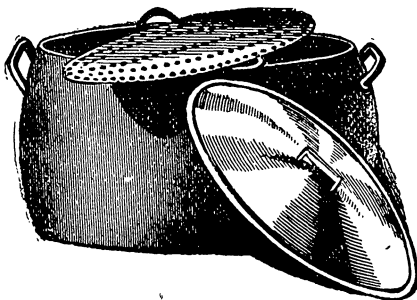
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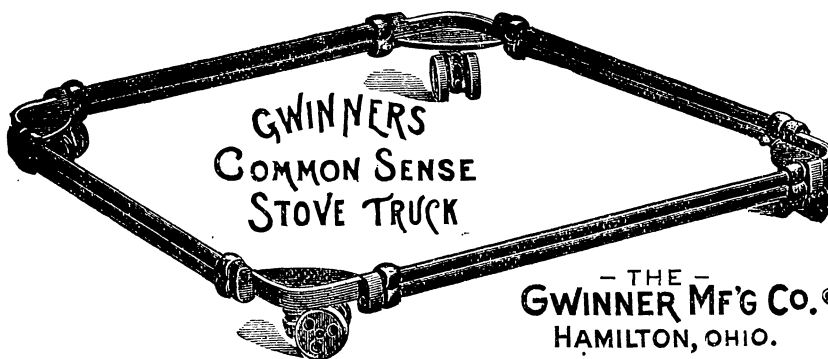
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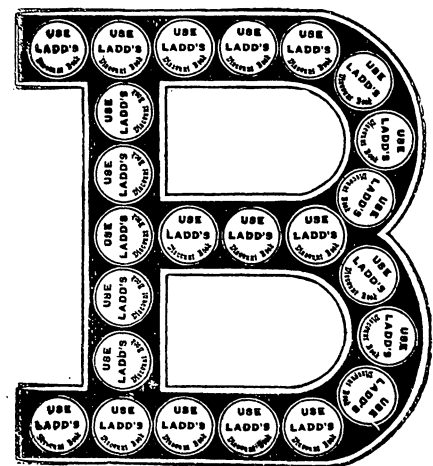
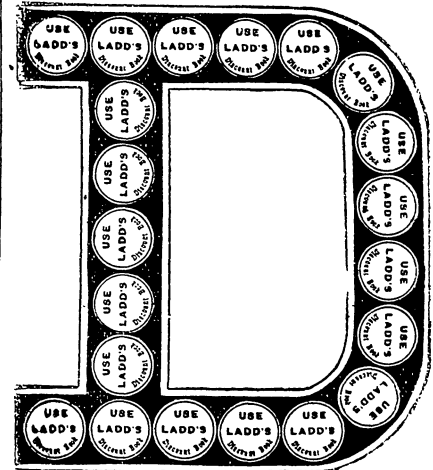
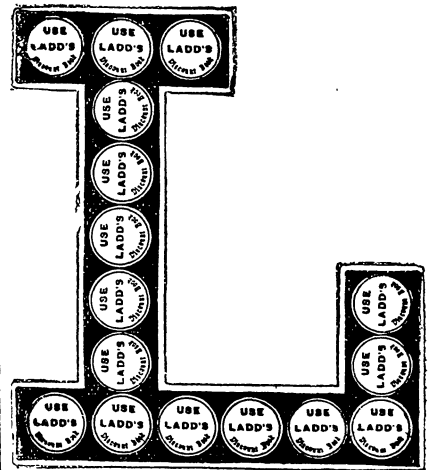
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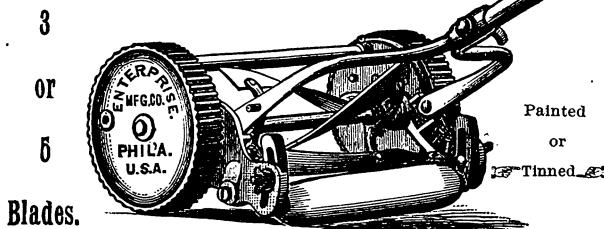
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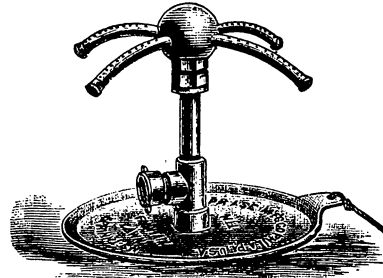
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Send for 226-Page Catalogue.

### MENDING CONE



For mending Tin, Copper, Sheet  
Iron and Agateware without solder  
or acid. A child can use it. Best selling  
article invented. Big inducements to  
agents. One box will mend 125 holes.  
Sample box by mail 25 cents.

Address, P. D. MURPHY, LOCKPORT, N. Y.



**NON-MAGNETIC \$2.00**  
AMERICAN WATCH.

The Premium Non-Magnetic  
Watch has a specially con-  
structed American Lever  
Movement, in Case of non-  
conducting metal, and is  
fully warranted to with-  
stand any attempt at mag-  
netization, and to keep  
accurate time around or  
against a dynamo. Every  
dynamo hand wants them.  
Mailed postpaid for \$2.00  
each; 3 for \$5.; 1 doz., \$18.00  
**R. H. INCERSOLL & BRO.,**  
65 CORTLANDT STREET, NEW YORK.

### CYCLONE CORN SHELLER.

Will Shell a Bushel  
of Corn

in 4 Minutes.

**BEST  
SHELLER**

All Machines  
Warranted.



Sample Sheller

**\$3.00.**

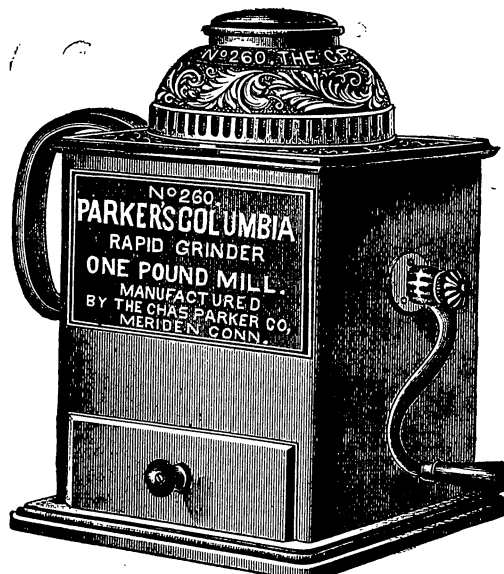
AGENTS  
WANTED.

Ask your  
Merchant

for it  
Send for  
circular.

**GARRY IRON ROOFING CO.,** Sole Manufacturers  
and Owners, Cleveland O., U. S. A. Mention Iron Age.

THE CHAS. **PARKER CO.** MERIDEN  
MANUFACTURERS OF  
THE PARKER CON VISES THE PARKER LAMP  
WOOD SCREWS COFFEE MILLS,  
CABINET-LOCKS SPOONS &c.



This illustration represents our Columbia One-Pound Mill No. 260.

The Handsomest and Best Mill of this Character in the Market.

We have over sixty other styles and sizes. Catalogues furnished dealers.

Some people try to imitate others. I once knew a man to try to vault a mule from its rear end as its owner had just done. His attempt was a failure and they sent him home on a stretcher. The sympathy of the onlookers was for the mule.—Puddinhead's son Will.

**W**E ARE the originators of a combined Show Case and Money Drawer for which we have applied for patent, and our attorneys assure us that our invention is novel and that we will be allowed clear and broad claims and a valid patent.

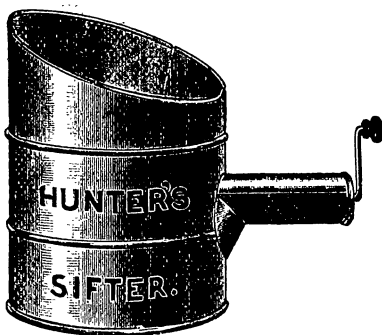
We therefore CAUTION all persons to not buy or sell said Combined Show Case and Money Drawer excepting those bearing our name plate. We will prosecute all offenders for infringement and damages soon as our patent is allowed, and thus resent the outrageous attack on our business.

## WADDEL WOODEN WARE WORKS,

Wholesale Manufacturers of Show Cases, Money Drawers, Coffee Mills, &c.,

— GREENFIELD, OHIO. —

# Sift It Down Fine.

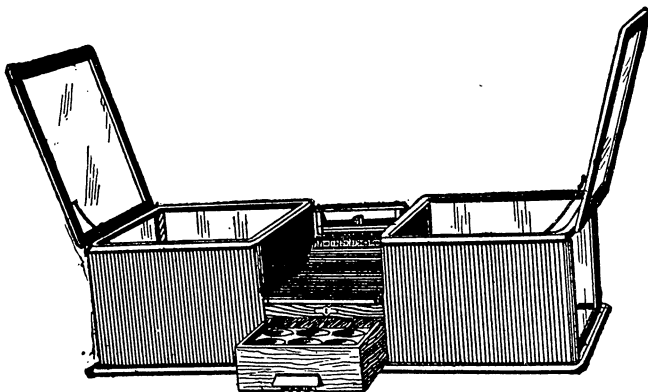


And where can you find a sifter that excels in any particular "The Hunter?" We will not even except price. If you want the best, and who does not? and that promptly, we can furnish them. We are now able to turn out over 4,000 daily. If others are so much superior, why don't they sell? Write for prices.

**The FRED. J. MEYERS MFG. CO.,**

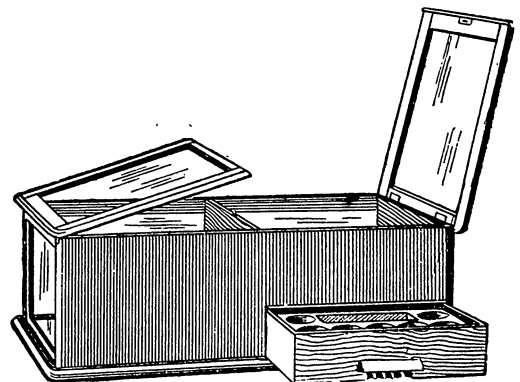
**HAMILTON, O.**

F. J. MATTISON, Eastern Agent,  
69 Beekman St., NEW YORK.



Combined Cash Register and Showcase Cash Drawer with Combination Lock.

**PRICE \$25.00, F. O. B. FACTORY.**



Combined Showcase and Cash Drawer Combination Lock.

**PRICE \$12.00, F. O. B. FACTORY.**

Combination Lock on Cash Drawer susceptible of 33 changes; can be set to a different combination in an instant. Automatic Lock on lid of Showcases that is operated by opening or closing Cash Drawer. Case cannot be opened from outside and can only be opened by knowing combination. Alarm Bell is sounded every time drawer is opened.

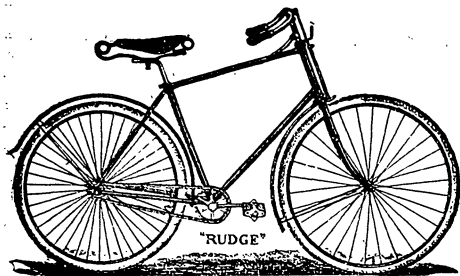
**CASH REGISTER KEEPS RECORD OF ALL SALES AND ADDS IN DETAIL THE FULL AMOUNT.**

**HUSTLING DEALERS CAN SELL HUNDREDS OF THEM.**

The demand is greater than the supply. Hard times cut no figure. Be quick if you want the cream of the trade.

**THE SUN MANUFACTURING CO.,**  
Greenfield, Ohio,

MANUFACTURERS OF  
Cash Registers, Money Drawers, Showcases, Coffee Mills, Specialties  
and Novelties.



## HARDWARE DEALERS AND RUDGE CYCLES.

Agents wanted immediately for unoccupied territory. Write for illustrated catalogue and Price-list of 1894 Wheels.

## The Bronson Supply Co.,

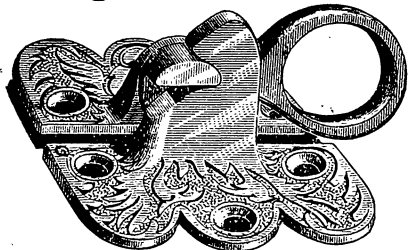
Sole Agents for the United States.

72 Beekman St., New York.

### "CONROY"

#### Refrigerator Door Fasteners

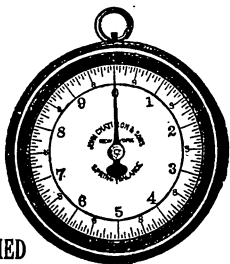
Have rapidly supplanted all others.  
Refrigerator Trimmings.



P. J. CONROY & CO., Paschall, PHILADELPHIA.

## John Chatillon & Sons.

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



ESTABLISHED  
1835.

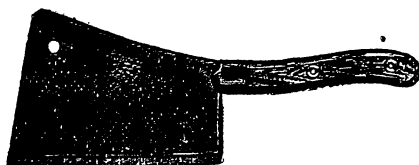
SEND FOR  
PRICE-LIST.



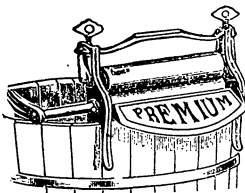
MANUFACTURERS  
OF  
**SCALES**  
—AND—  
**BUTCHER TOOLS.**

Sole Agents for

Foster Bros.' Butchers' Cutlery.



John Chatillon & Sons, N. Y.



COLBY WRINGER CO., - Montpelier, Vt

MANUFACTURERS OF THE

### Premium Wringer,

With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, Direct Representatives,  
15 Murray Street, New York.



No. 3

Globe Street Lamp.

Light your Streets and Driveways.

The S. G. & L. CO.

## Tubular Globe Street Lamp

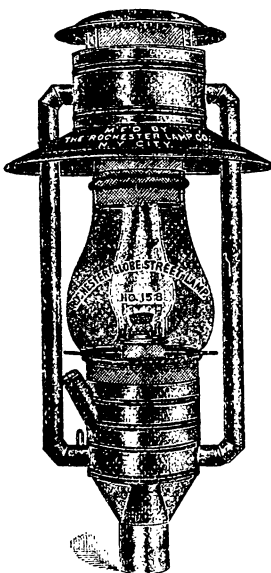
IS THE Best Street Lamp Manufactured.  
Equal to the best Gas Light.  
Will not Blow Out in the Strongest Wind.  
Will not Smoke.  
Will not Freeze.  
Automatic Extinguisher.  
Outside Wick Regulator.  
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



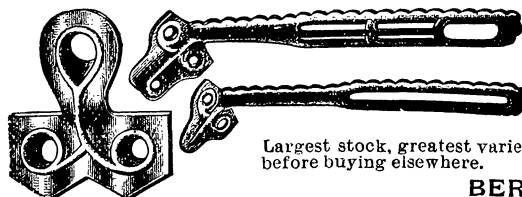
## The Rochester Globe Tubular - - Station and Street Lamp.

It's a long name, but it tells a good deal. It tells you of a new Street Lamp with "The Rochester" Central Draft Burner. A central draft burner (round flame) gives three times the light of an old style flat-wick burner. The first and only Tubular Globe Central Draft Lamp ever made! Storms, rain, snow, sleet or hail do not affect it. Burns all night. Made with either bail or post socket, with 26 inch enamel reflector if wanted, for railroad and other uses. Takes regular No. 3 or 9 street lamp globe, to be had everywhere. For Railroad Stations, Ware-rooms, Mills, Docks, &c., it is the best lamp ever made. •Price, \$6.00; send for trade discount.

MANUFACTURED ONLY BY

THE ROCHESTER LAMP CO.,

42 PARK PLACE, }  
37 BARCLAY ST., } NEW YORK.



HEADQUARTERS FOR

## TINNERS' HARDWARE & ROOFERS' SUPPLIES.

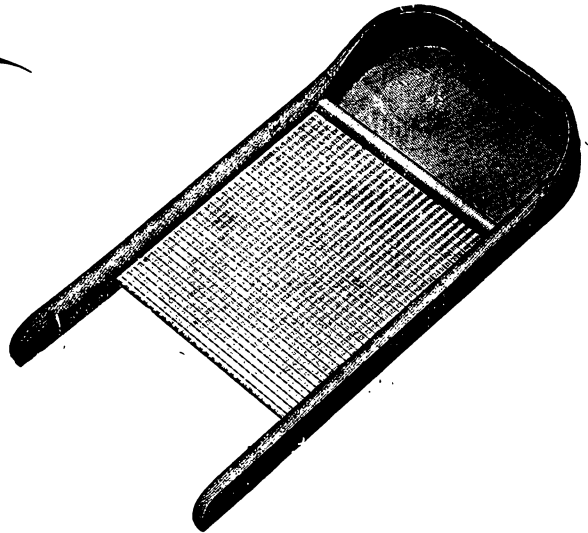
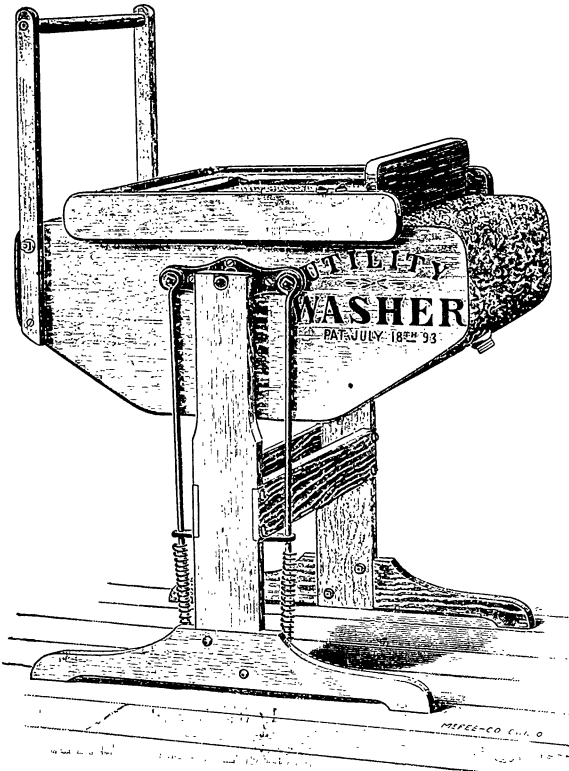
Largest stock, greatest variety. Prices lower than ever. Write us before buying elsewhere.

BERGER BROS., Philadelphia.

## BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.

# Utility



## Washer and Board

Your customers can get along without both, but neither separately. The washer has the peculiarity of washing the clothes clean and not wear out either it or the operator. While the board is something entirely new yet thoroughly tested and proven the best made. Write for prices, please.

**Olds Wagon Works,**  
Fort Wayne, Ind., U. S. A.

## NO. 4 ALL RATTAN BROOM.

Made for Switch, Snow, Yard, and all purposes to which an All Rattan Broom is especially adapted. It has been thoroughly tested, and our patent fastening is conceded to be the best, most convenient, and holds the rattan more firmly and in better shape than any other ever introduced. A trial will insure its continued use. We make a specialty of

**BROOMS and BRUSHES**

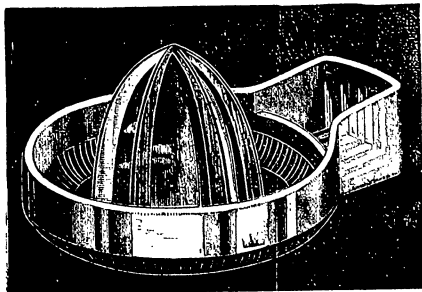
FOR  
RAILROADS, SHOPS, WAREHOUSES, STREET, STABLE,  
BLOOM, CHILL, CASTING AND MOULDING PURPOSES. Write

**JOSEPH LAY & CO.,**

RIDGEVILLE, IND.

## IT'S A CUP, STRAINER AND EXTRACTOR.

ALL IN ONE and works SO EASY.



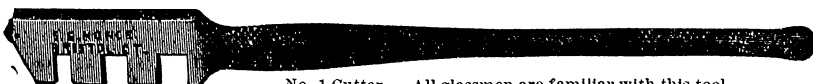
Patented December 15, 1891.

**STERLING ALUMINUM CO.,**

1195 FULTON STREET

BROOKLYN, N. Y.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS



No. 1 Cutter. All glassmen are familiar with this tool.

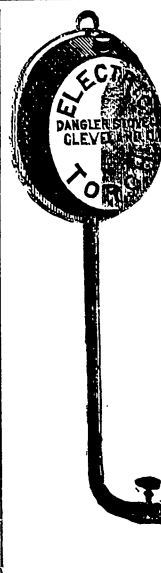
**S. G. MONCE, BRISTOL, CONN.**

## Dangler Electric Torches

FOR  
GASOLINE  
OR  
OIL.

14 JETS OF LIGHT

3 to 6  
INCHES  
LONG.



FOR lighting manufacturing establishments, such as Rolling Mills, Foundries, Machine Shops, Engine Rooms, &c., &c., with a convenient, portable, brilliant, steady light, and by cheaper means than by Coal Gas.

SOLE MANUFACTURERS,

**The Dangler Stove & Mfg. Co.,**  
Cleveland, Ohio.

# N. R. STREETER & CO.,

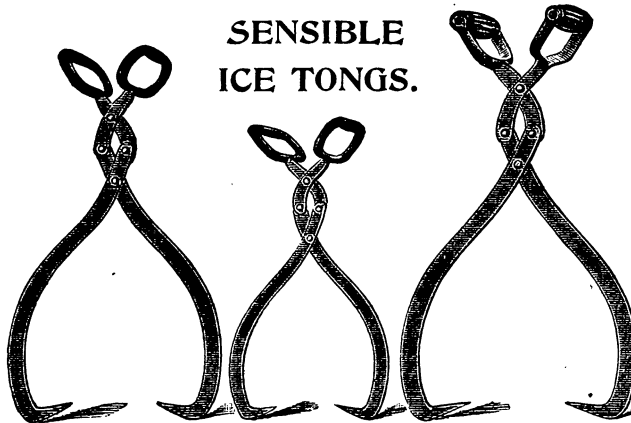
Manufacturers of **SAD IRONS AND HARDWARE.**

All of our Ice Tongs, for loading or hand use, are made of steel, with tempered points, causing them to be very light and stiff.

The Shape, Finish and Quality of all our goods is second to none.

Factories,  
Rochester, N. Y.  
Pottstown, Pa.

SENSIBLE  
ICE TONGS.



REGULAR SIZES, 12 IN., 16 IN., 20 IN., 24 IN., 28 IN.  
Special sizes made to order.

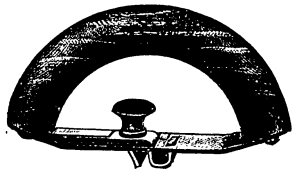
General Office, Groton, N. Y.

Our Improved Duplex  
Tongs

give the widest sweep at the points, with but comparatively small action at the handles, and the duplex action gives greater force.

Write for our 1894 Catalogue of Standard Goods and Patented Specialties.

New York Office,  
W. H. JACOBUS,  
90 Chambers St.

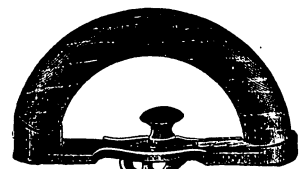


PATENT APPLIED FOR.  
The Steel Stretcher Handle,  
for Mrs. Potts' Sad Irons,  
in Hazel Wood only.  
No. 110.

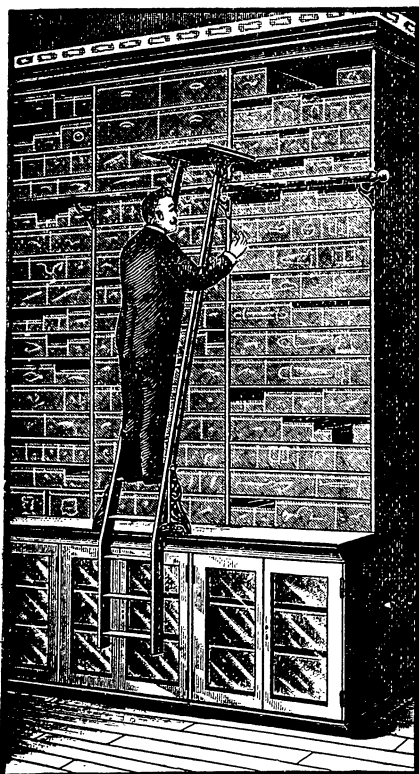
The Cleveland Wood Turning Co.,  
710-726 Scranton Ave., Cleveland, O.

Special work in Handles and Wood Turning of all kinds. Our line of regular made Tool Handles is the best.

New York Office:  
W. H. JACOBUS,  
No. 90 Chambers St.



Walnut, Japanned, No. 1.  
Walnut, Tinned, No. 2.  
Hazel, Japanned, No. 10.  
Hazel, Tinned, No. 20.



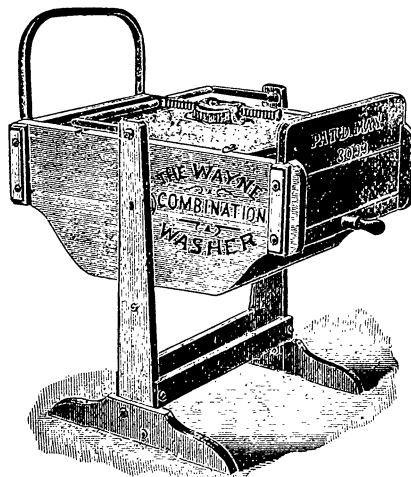
## THE BICYCLE STEP LADDER.

Highest Award, Columbian Exposition.  
The Newest, Neatest, Simplest, Easiest Operated  
and Safest Store Ladder made.  
Ladders are not Suspended, but Supported from  
below on wheels. Move easier with operator on than  
others when empty. Highly finished, and very hand  
some. Made in different grades and prices to suit.  
Send for illustrated catalogue and prices.  
See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street,  
Chicago, Ill.

# RUB! RUB! RUB! (The old back breaking way.)

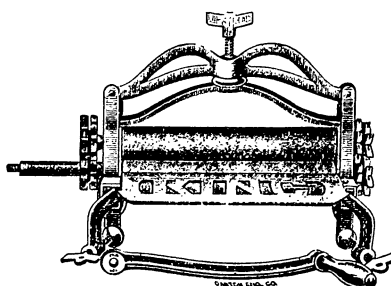
Thousands are using the Anthony Wayne Combination Washer.



## WHY?

Ask any one of them They will tell you it's because they do not experience "that tired feeling," as when using other makes, besides it was got up so that a woman could use it without finding fault with its work. Have you had our circular, Mr. Dealer? If not send us your address.

Anthony Wayne Mfg. Co.,  
FT. WAYNE, IND.



We are Sole Manufacturers of the  
Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron  
Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers  
given to one dealer in each town.

Write for Catalogue.  
**THE NATIONAL WRINGER CO.,** CANTON, OHIO.  
New York Office, 107 Chambers St., John T. Ryan, Mgr.

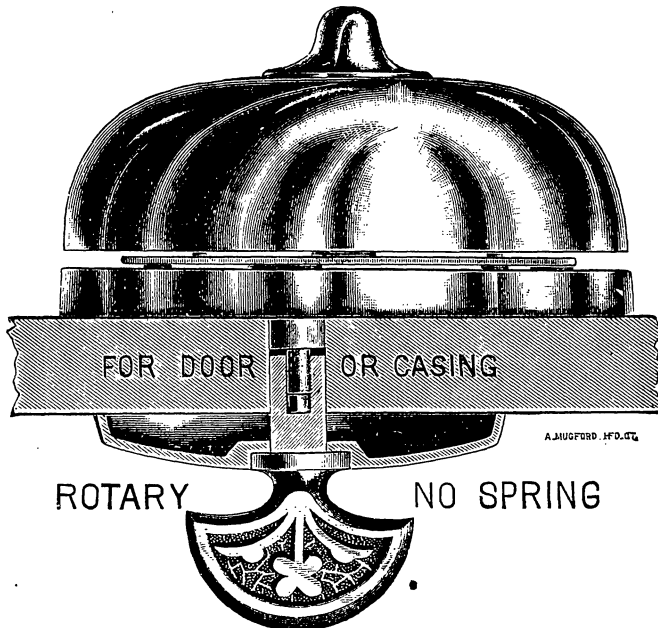


# NEW DEPARTURE "ROTARY" DOOR BELLS

## ELECTRICAL RESULTS.

3 Inch.

No. 91, Nickel Plated.  
No. 92, Bronze Plated.  
Per Doz., \$17.50.



3 1/2 Inch.

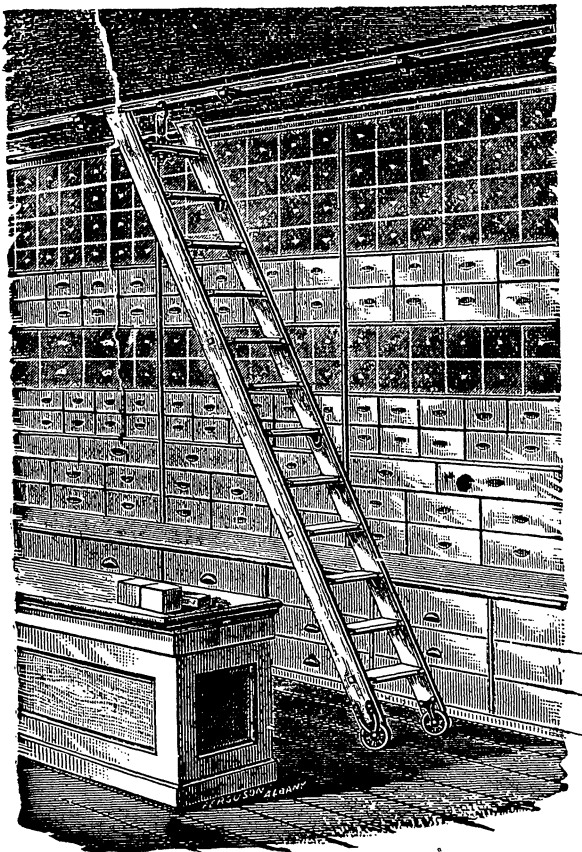
No. 101, Nickel Plated.  
No. 102, Bronze Plated.  
Per Doz., \$20.00.

Simply turning the knob about **one-fourth** in either direction produces about **ten clear, full tones**, which though not startling or annoying, can be better heard all through the house than any bell ever made to imitate Electrical Results.

SOLE AGENTS,

**JOHN H. GRAHAM & CO.,** { 113 Chambers St.,  
N. Y. CITY, N. Y.  
**WRITE FOR PRICES.**

## THE "NOISELESS" STORE LADDER.



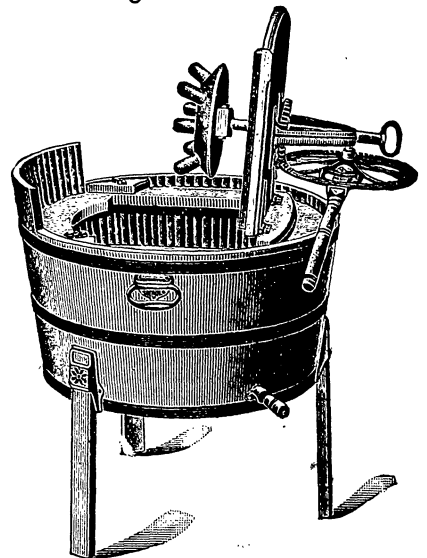
The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

M. CROISSANT,

ALBANY, N. Y.

## The Corrugated Round Washer.



Our Special Construction, Superior Workmanship, Beauty of Finish, and recent Patented Improvements,

Cause thinking dealers to investigate this washer, with but one verdict—

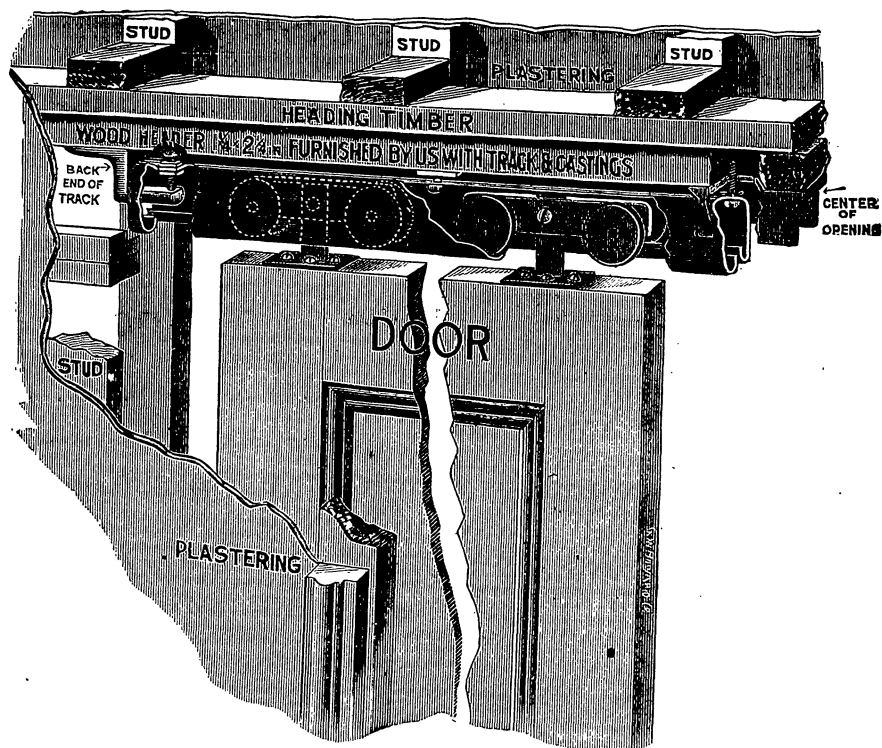
**IT IS PERFECTION.**

Write for bottom prices.

DIETHER & BARROWS, Fort Wayne, Ind.

**Boxes Made Absolutely Secure**  
BY USING THE **PORTABLE BOX BANDER**  
ONE MAN CAN BAND YOUR BOXES QUICKER THAN TWO MEN CAN IN ANY OTHER WAY.  
HOOP IRON WIRE OR ANY OTHER FLEXIBLE MATERIAL CAN BE USED EQUALLY WELL. Send for price  
SOON PAYS FOR ITSELF **J.W. GOODELL • BURLINGTON, VT.**

# Patent Trolley Track and Trolley Track Door Hangers,



GET OUR CATALOGUE OF

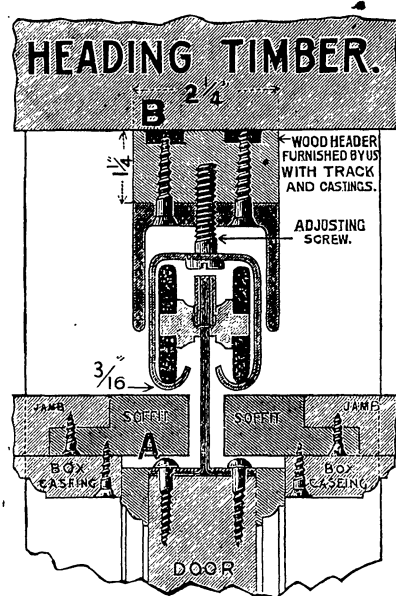
PARLOR  
BARN  
FIRE

## Door Hangers

— AND —

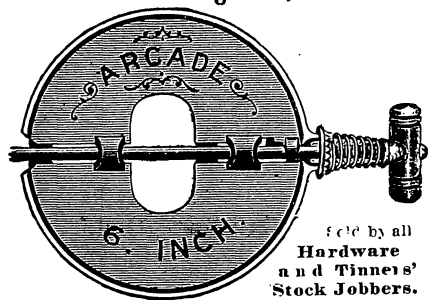
Easy Running STORE LADDERS.

Send a Postal Card for it.

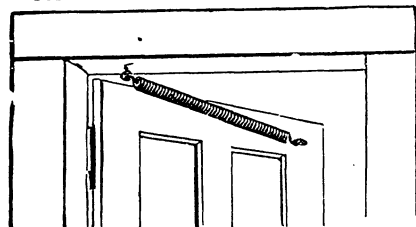


Coburn Trolley Track Manufacturing Co.  
HOLYOKE, MASS.

Made by **Arcade Mfg. Co.,** Freeport, Ill.



### THE PERFECT DOOR SPRING.



**Cheap, Simple, Durable, Effective.**  
Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.

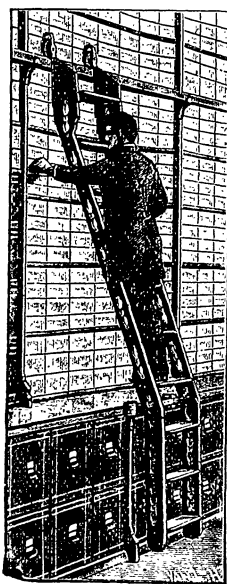
**COILED WIRE BELTING CO.,**  
40 & 42 Noble St., Jersey City.

**Electric Toy Making, Dynamo Building and Electric-Motor Construction.** By T. O'CONOR SLOANE, A.M., E.M., Ph.D. This work treats of the making at home of electrical toys, electrical apparatus, motors, dynamos, and instruments in general and is designed to bring within the reach of young and old the manufacture of genuine and useful electrical appliances. The work is specially designed for amateurs and young folks. Very fully illustrated..... \$1.00

For sale by David Williams 96-102 Reade St., N. Y.

## An Investment

That soon pays for itself, and a fixture you will wonder how you have got along without. Hundreds of recommendations to this effect. This is without doubt the best device of the kind on the market to-day. Steel rail planed to get the smoothest surface. Brackets made to fasten to standards, pilasters, or shelving direct. Can be adjusted to shelving with wide or narrow ledge, and can also be fitted where there is no ledge and can be used on circular rail as well.

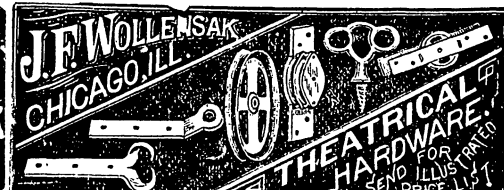
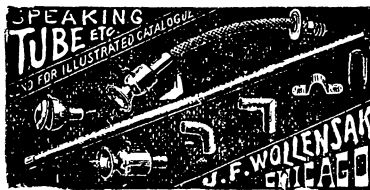


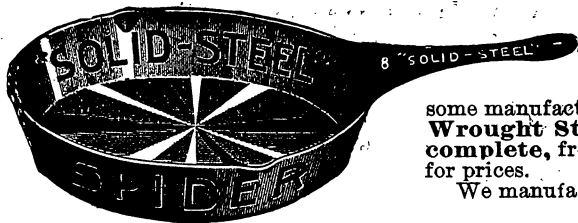
**WORLD'S FAIR AWARD.**

A postal card will get our Catalogue.

## Morley Brothers,

123 N. Washington Ave., Saginaw, Mich.



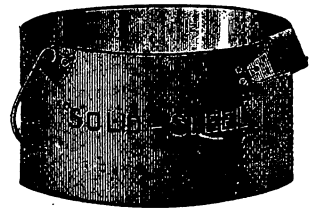
**"SOLID-STEEL" SEAMLESS HOLLOW WARE.**

No Seams, no Rivets in "Solid-Steel" Ware.

**Brilliant Finish.**

Notwithstanding the claims made by some manufacturers' agents our spiders are made from **Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal.** Write for prices.

We manufacture our own goods.



"Solid-Steel" Maslin Kettle.

**The Cleveland Stamping & Tool Co., Cleveland, O.**

**We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.**

**Cooking Made Easy!**

—BY THE—

**"New Process" (Evaporating) Stove****LIGHTS LIKE GAS.**

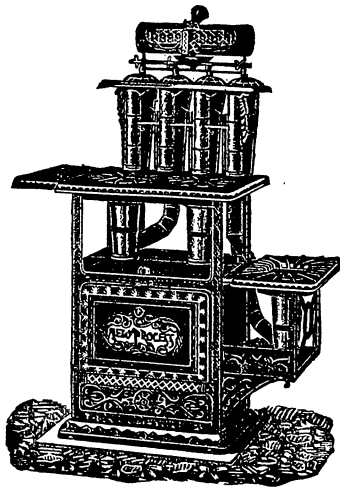
Consumes less gasoline than any other vapor stove made. No waste when not cooking. No heat when not in use. No overheated kitchen.

More than a quarter million in use in the United States.

More than 20,000 enterprising dealers selling them.

Bakes Better and Costs less than any Coal or Wood Range.

Saves both Time and Money. No Soot, no Dirt, no Ashes.



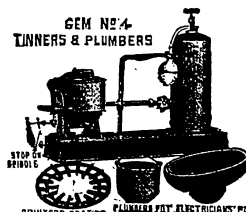
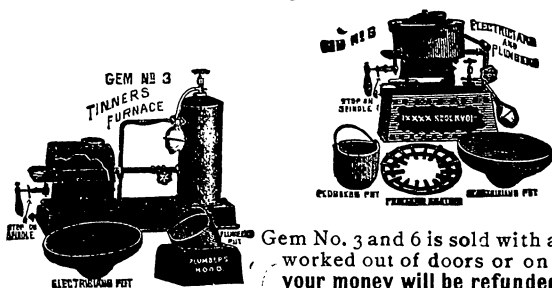
Send for Illustrated Catalogue, giving full particulars to

**THE STANDARD LIGHTING CO.,**

600-620 Perkins Avenue, Cleveland, Ohio.

**Burgess Gem Gasoline Soldering Furnaces.**

Have Slotted Cylindrical Cast Iron Burner, shape is such that Solder Cannot Clog them.



Gem No. 4 and 6 will melt 12 lbs. of lead in 8 minutes, heat your coppers and melt metal at same time.

Gem No. 3 and 6 is sold with a **GUARANTEE** that if it cannot be worked out of doors or on roofs in all kinds of weather your money will be refunded.

Ask your Jobbers for them or write for prices.

Manufactured by **Burgess Soldering Furnace Co., COLUMBUS, OHIO.**

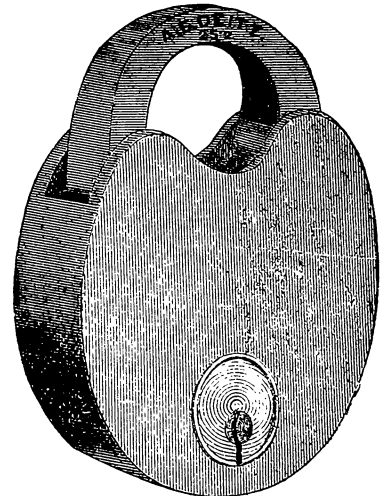
**MERRY-GO-ROUND.**

Lots of fun. Safer than swings. Four can ride and operate it. Children like it. Adults can use it. Strong, durable, painted, varnished. Requires 12 feet floor or lawn space.

Send for Circular.

**W. J. CLARK & CO.,**  
Salem, Ohio.

**A. E. DEITZ**

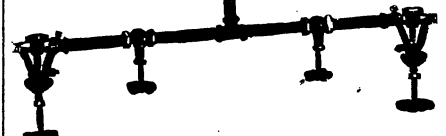


**J. C. McCARTY & CO., Agents,**  
97 Chambers and 81 Meade Sts., New York.  
Factory, **BROOKLYN, E. D., N. Y.**

Reliable Torches are what you want.



Made either for Oil or Gasoline.



These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by **THE SCHNEIDER & TRENKAMP CO.,** Nos. 479 to 497 Case Ave., Cleveland, Ohio.



**INTERCHANGEABLE LOCK-CORNER SHELF BOXES,**  
Screw Cases, &c.,  
FOR THE HARDWARE TRADE.  
**A. H. GREEN,**  
22 Park Place, New York.

TEMPORA MUTANTUR ET NOS MUTAMUR IN ILLIS.

**RUSSELL & ERWIN MANUFACTURING CO.,**

NEW BRITAIN, CONN.

NEW YORK.

PHILADELPHIA.

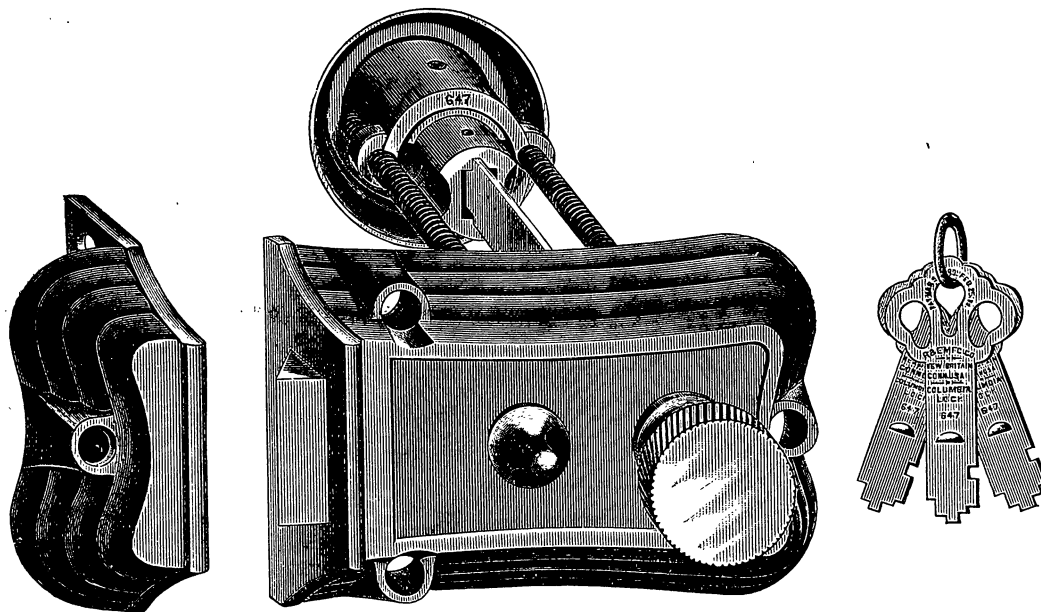
BALTIMORE.

LONDON.

MANUFACTURERS OF THE

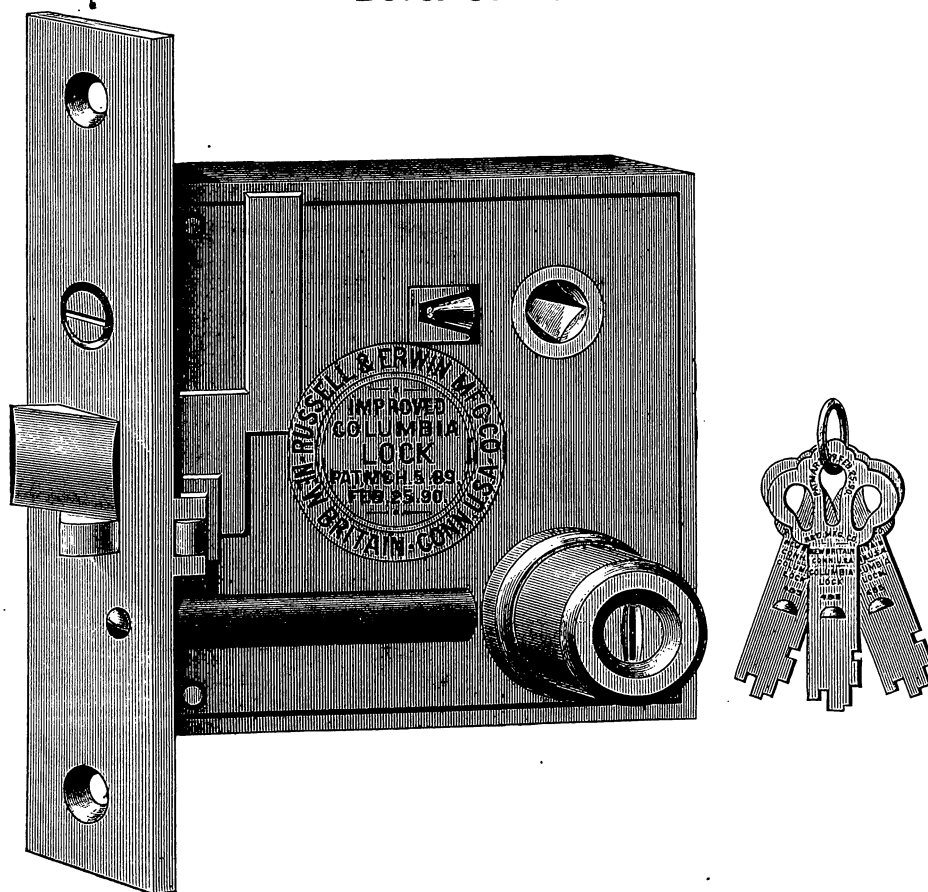
**Columbia Cylinder Locks.**

EASILY APPLIED. NO ADJUSTMENT OF CYLINDER REQUIRED.



RIM NIGHT LATCH No. C1290.

Adjustable for Doors from 1 1/4 to 3 Inches. Packed with Regular and Reverse Bevel Strike.



VESTIBULE MORTISE KNOB LATCH No. C1232.

# READING Hardware Company

Manufacturers of

## Fine Locks

AND

## BUILDERS' HARDWARE

OF ALL KINDS.

Artistic  
Bronze Goods.

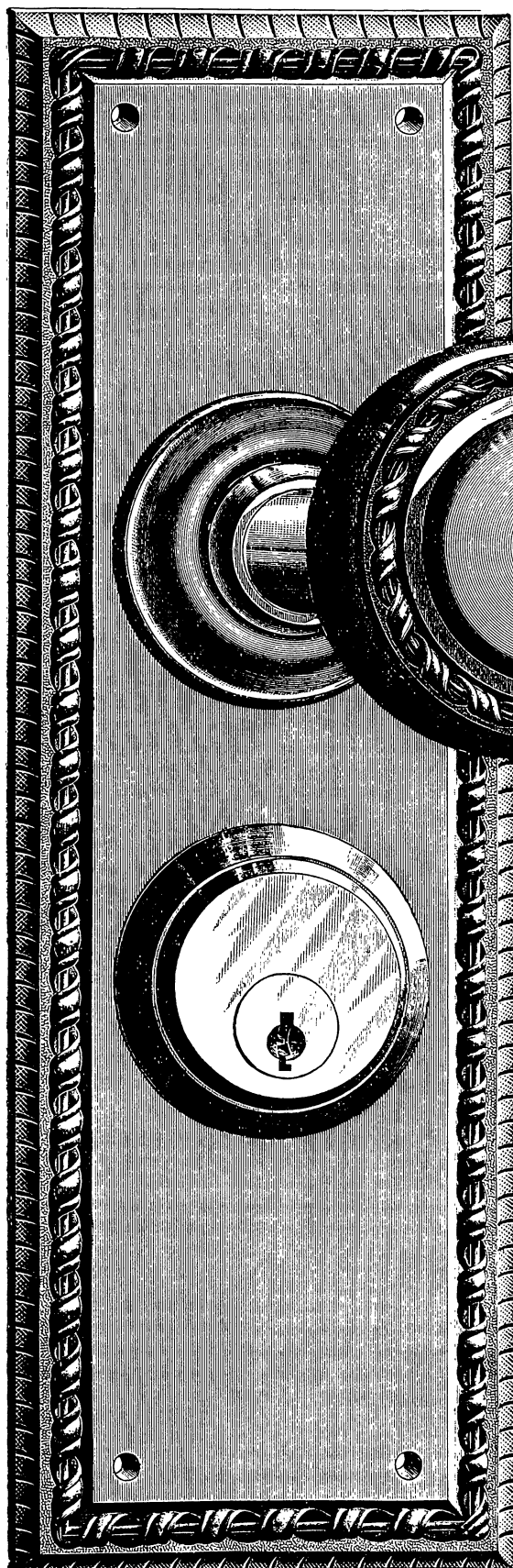
THE BEST AND SAFEST:

## “VASSAR” CYLINDER LOCK.

Factories, = READING, PA.

Warehouses:

New York,	Philadelphia,
81 Reade St.	514 Commerce Street.
Chicago, 73 Wabash Avenue.	



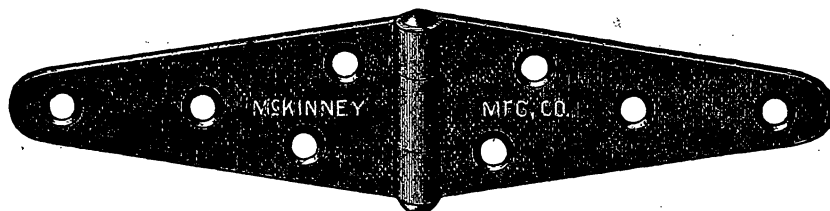


# STEEL HINGES AND BUTTS.

— STANDARD GOODS. —

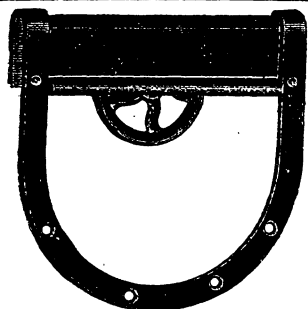
McKINNEY MFG. CO., - ALLEGHENY, PENN.

SEND FOR  
LIST.



ORDERS FILLED  
ON SIGHT.

**"NONE BETTER."**



HIGHEST AWARD  
WORLD'S  
COLUMBIAN EXPOSITION  
— ON —

**BARN DOOR HANGERS.**

For catalogue and prices, address

**Chicago Spring Butt Co.,**

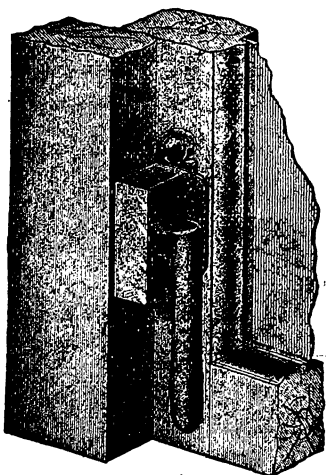
**CHICAGO, ILL.,**

or 97 CHAMBERS ST., N. Y.

**DOLBER'S**

**SASH FASTENER.**

Patented Aug. 1, 1893.



THE BEST DEVICE EVER INVENTED FOR FASTENING STATIONARY

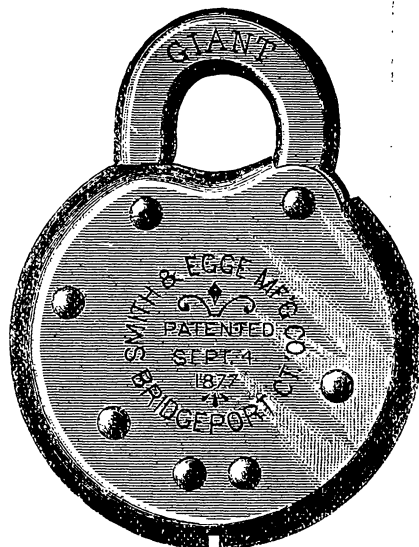
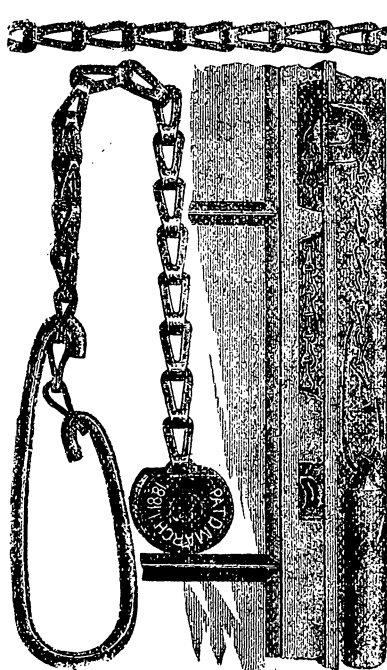
Screens, Shutters or Windows.

The above shows Fastener as applied to the side of an outside window, fastening same to the outside casing.

Saves Time, Labor and Expense.

F. V. WOOSTER, 66 Beverly St., Boston.

**THE SMITH & EGGE MFG. CO.,**  
BRIDGEPORT, CONN.



**THE GIANT PADLOCK.**

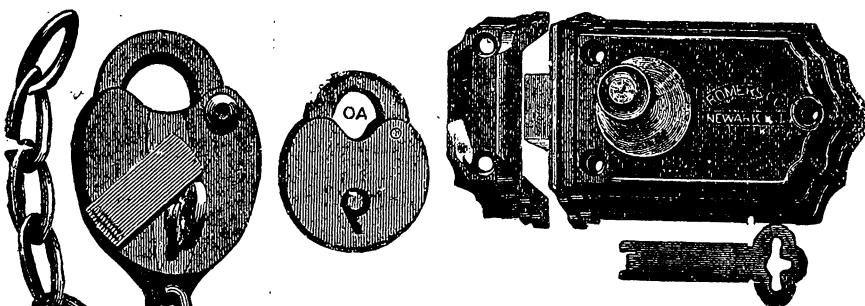
Centennial Award. "Superior in Every Respect."

This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

**THE GIANT METAL SASH CHAIN**

is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

**ROMER & COMPANY,** Manufacturers of PATENT  
JAIL LOCKS, BRASS and IRON PADLOCKS,



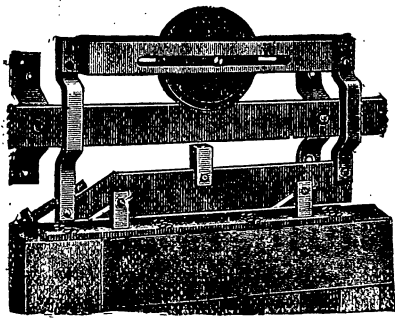
Adjustable Door Knobs and Trimmings,  
Front Door Handles.

Patent Horizontal Rim Cylinder Reversible Night Latches.

Illustrated Lists sent to the Trade on application.

275, 277 and 279 Passaic St., near Erie and D. L. & W. R. R. Depots, Newark, N. J.





## LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.  
The Wheel is also Steel, except the filling or tread.  
The Track is of Steel—a single one only.  
The Hanger is Anti-Friction.  
More nearly Noiseless than any other.  
Ease of adjustment.

Can be erected with half the labor others require.  
Track will not swell, shrink or warp out of true.  
No cutting of doors.  
No matching of hardware.  
Simplicity in all its parts.  
Durability.

ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

**LANE BROS., Poughkeepsie, N. Y.**

**JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., New York.**

**IDLEWILD  
HAMMOCKS.**

**HOT WEATHER STUFF.**

**WILL PAY YOU  
50% PROFIT.**

**TWELVE  
HAMMOCKS  
ASSORTED,** } net to  
the dealer  
**\$16.20.**

We are putting out sample bales of  
**IDLEWILD HAMMOCKS,**  
containing 12 numbers, all medium and  
low priced goods.

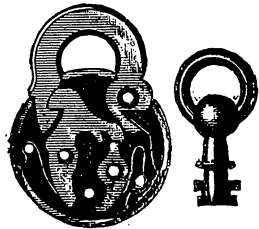
**JAMES W. EUSTIS COMPANY,  
Idlewild Hammock Mills,  
19 PEARL ST., BOSTON, MASS.**

**THIS IS THE  
SEASON.**

**SELLS WHEN NOTHING ELSE WILL.**

**NOW IS THE  
TIME.**

## PATENT PERFECTION PADLOCK.

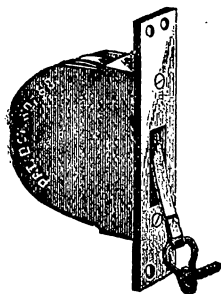


*Eight Tumblers, Key Turning Both Ways.*

Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.  
Adopted by the United States Treasury for bonded warehouses.

**AMES SWORD CO., Chicopee, Mass.**

Send for Price-Lists and Circulars.



**DOES IT PAY?**

To buy an inferior article, which your  
trade condemns, when you can get

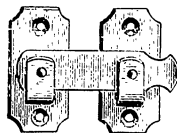
**THE CALDWELL SASH BALANCE.**

The best material, right principle and  
care in making and testing have made  
it the **LEADER** for five years. Write to

**CALDWELL MFG. CO., Rochester, N. Y.**

No. 450

**BRONZED WROUGHT STEEL SHUTTER BARS.**



**STRONG AND ELEGANT.**

Size,  $1\frac{3}{4}$  inch. 2 inch.  
Per dozen, \$0.50. \$0.55

**THE STANLEY WORKS, NEW BRITAIN, CONN. 79 CHAMBERS ST., N. Y.**

**STAR LOCK WORKS, PHILA.**

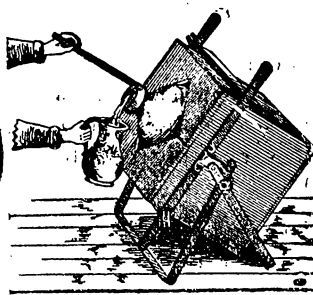
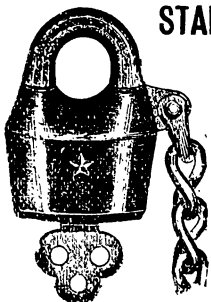
**W. & L. WOLF,**

MANUFACTURERS OF  
1st QUALITY ONLY  
**SCANDINAVIAN**  
AND

Spring Padlocks,  
Trunk & Case Locks,

Carboy Stands, &c.

Catalogues Sent on Application.



## Ideal Sash Pulley

No. 60-65.

**AUGER MORTISE—FACE PLATE.**

Made with two inch wheel,  
plain and polished, cone  
axle bearings, noise-  
less and easy run-  
ning; markers on  
the side to lay off  
the centers to bore  
the holes by.

The best and most  
uniformly made low-  
priced Sash pulley  
on the market.

Sample Free.

**STOVER MFG. CO.,**  
145 River St., Freeport, Ill.

## SASH WEIGHTS

**E. E. BROWN & CO.,**

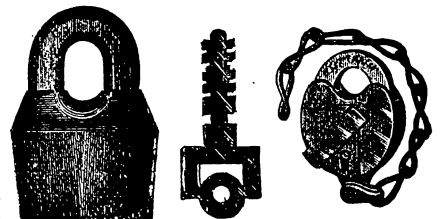
McKean and Meadow Sts.,

**PHILADELPHIA, PA.**

ESTABLISHED 1879.

**KEYSTONE LOCK WORKS.**

**E. T. FRAIM, Lancaster, Pa., U. S. A.**



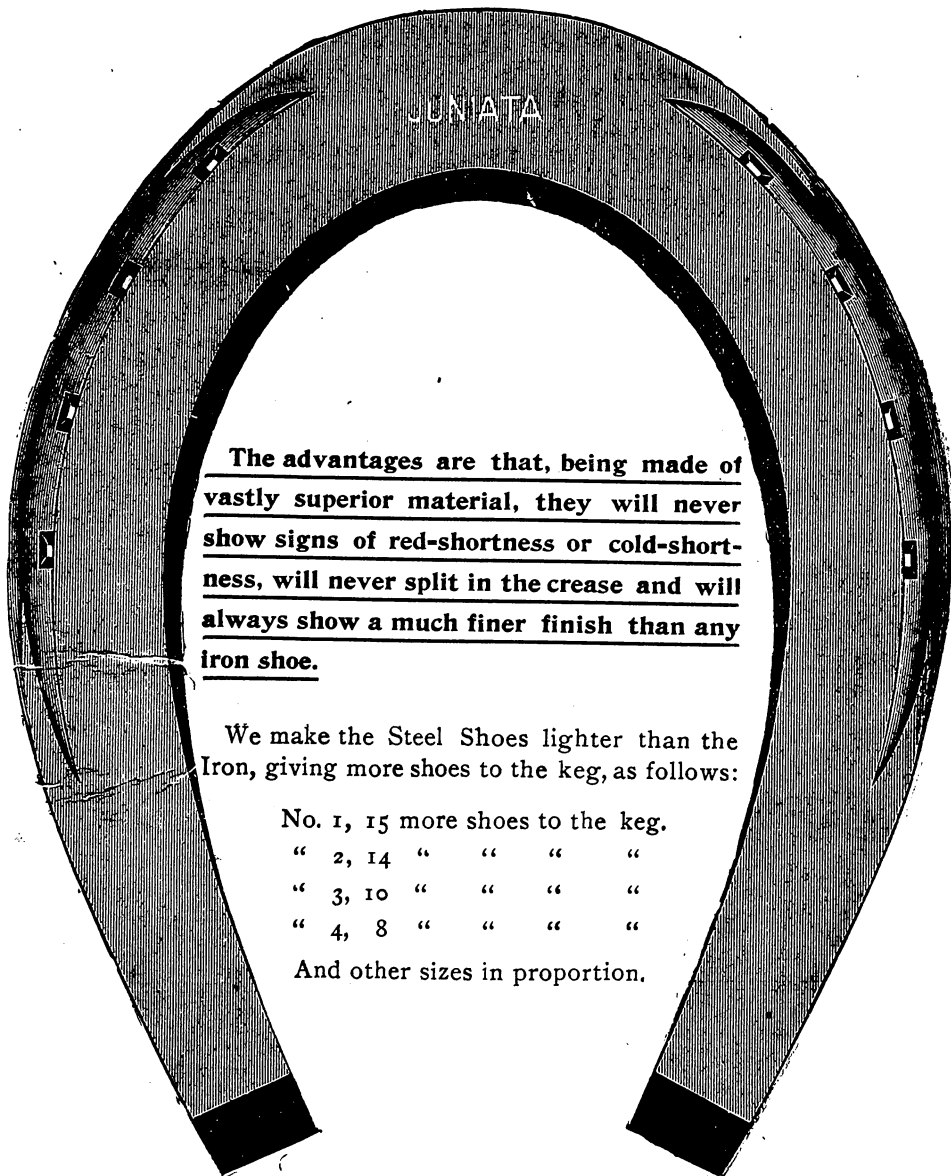
Originators, designers, patentees and manufacturers  
of all the leading popular styles of **PADLOCKS**,  
Key-Locking Scandinavian with our patent Inter-  
Locking Tumblers; the only reliable lock of this style  
ever made. **SELF-LOCKING** Scandinavian of  
the highest type of perfection. Dust Proof Railroad,  
Freight Car and Switch Padlocks. Brass, Bronze,  
Steel and Malleable Iron Padlocks for all purposes and  
in all finishes. 131 different kinds. Write for our new  
100-page catalogue.

**SUPPLES, DUNN & ALDER, General Agents,**  
97 Chambers St., NEW YORK.

# STEEL HORSE SHOES.

SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

No. 2 EXTRA SWAGED, FRONT.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

## SHOENBERGER & CO.,

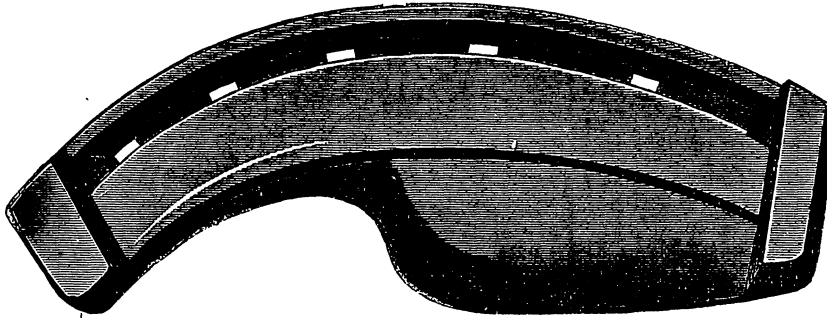
JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH, PA.

# SCRANTON FORGING CO.,

SCRANTON, PA

## CARRIAGE HARDWARE <sup>AND</sup> SPECIAL DROP FORGINGS.

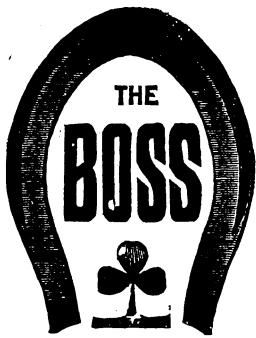
FORGED  
OX  
SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



## HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

BRYDEN HORSE SHOE CO.,

CATASAUQUA, PA.

RHODE ISLAND PERKINS HORSE SHOE CO.,  
MANUFACTURERS OF

Horse and Mule Shoes of the Perkins Pattern.

SPECIALTIES:—X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.  
Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I.  
F. W. CARPENTER, Pres., C. H. PERKINS, Gen. Manager, R. W. COMSTOCK, Sec'y,  
CHARLES R. STARK, Treas.

J. C. McCARTY & CO., Agents - 97 Chambers Street, New York.

## THE NEW DIAMOND STATE HORSE AND MULE SHOES.

JUST TRY THEM and YOU will say they excel all others.  
MANUFACTURED BY

DIAMOND STATE IRON CO.  
WILMINGTON, DELAWARE.

Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blank Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &c.

PHILADELPHIA OFFICE,  
206 So. Fourth St.

{ Correspondence invited }

NEW YORK OFFICE,  
11 Pine St.



Elegant Iron.

Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

MULE SHOES,

Light, Medium and Heavy.

Illustrated booklet and prices to all parts of the world on application.

OLD DOMINION IRON AND NAIL WORKS CO.,

ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

Richmond, Va.. U. S. A.

BURDEN'S

## HORSE SHOES.

"Burden Best"

Iron

Boiler Rivets.

The Burden Iron Co.

TROY, N. Y.

## PHOENIX HORSE SHOES.

PHOENIX HORSE SHOE CO.,

ROLLING MILLS AND FACTORIES,

Poughkeepsie, N. Y.

Joliet, Ill.

NEW YORK OFFICE, No. 66 Reade St.

Standard Horse Shoe Co.,

Manufacturers of

HORSE AND MULE SHOES.

LEEDS, ROBINSON & CO., General Agents,

4 Liberty Square, Boston, Mass.

**HIGHEST AWARD**  
—AT—  
**World's Columbian Exposition.**

In the tests submitted before the judges on awards  
the Capewell No. 6 was shown to be 17 per cent. tougher  
than No. 8 of other makes.

**CAPEWELL HORSE NAILS,**  
—MADE BY—  
**THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.**

**Office of D. G. BURNHAM,**  
Director of Works, World's Columbian Exposition,  
JACKSON PARK, CHICAGO, ILL.

October 28, 1893.

TO THE CAPEWELL HORSE NAIL CO.:  
Gentlemen—I have used your horse nails here on the horses belonging  
to the World's Columbian Exposition, and I think they are far superior  
to any others that I have ever used. As I have been in the  
horseshoeing business for about twenty-five years, I know  
what I am talking about.

Very respectfully,  
HERMAN J. HENKE,  
Foreman Blacksmith, World's Columbian Exposition.

“The Best  
Driving  
Nail.”

“The Best  
Nail to  
Hold.”


The  
Capewell  
Patent  
Corrugated  
Horse Nail.

Needs  
No  
Clinching.

At Centennial Exposition **HIGHEST AWARD** At World's Columbian Exposition  
AT PHILADELPHIA. AT CHICAGO.

TO THE  
**PUTNAM**  
HOT-FORGED AND HAMMER-POINTED  
**HORSESHOE NAILS.**

REGULAR HEADS for ordinary creased shoes.  
CITY HEADS, or short heads for shallow creased shoes.  
COUNTER HEADS for “Goodenough” shoes.  
FRENCH HEADS for punched shoes, without creases.

These Nails are drawn from head to point from the BEST SWEDISH IRON RODS at a  
welding heat, thus:  by percussive hammer blows only; then polished by the  
water process, without the aid of acids, and hammer-pointed without any rolling or shearing.

They are the best because they are made of the best iron, and by the only process in which the iron is treated  
naturally, and its strength preserved.

Those who handle only the best goods hold the confidence of their customers.

**Putnam Nail Co., Neponset, Boston, Mass.**

# H. D. SMITH & CO.,

Plantsville, Conn.,

MANUFACTURERS OF THE BEST QUALITY

## CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

# FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

# CHAMPLAIN

Manufactured by the **NATIONAL HORSE NAIL CO.,**  
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

J. C. McCARTY & CO., Agents, New York.

## LE COUNT'S HEAVY STEEL DOG,

With Steel Screws. U. S. Standard and the points hardened.



1.....	3/8.....	\$0 40	13.....	2 1/4.....	\$1 35
2.....	1/2.....	50	14.....	2 1/2.....	1 45
3.....	5/8.....	60	15.....	3.....	1 60
4.....	3/4.....	70	16.....	3 1/2.....	1 80
5.....	7/8.....	70	17.....	4.....	2 10
6.....	1.....	80	18.....	4 1/2.....	2 75
7.....	1 1/8.....	80	19.....	5.....	3 25
8.....	1 1/4.....	80	20.....	5 1/2.....	4 00
9.....	1 1/2.....	95	21.....	6.....	5 00
10.....	1 3/4.....	95	22.....	7.....	6 00
11.....	1 7/8.....	1 10	23.....	8.....	7 00
12.....	2.....	1 20	24.....	9.....	8 00

One small set of 8, by 1/4 in. to 2 in.  
One set of 12, by 1/4 in. to 2 in., continued by 1/2 in. to 4 in. 13 20

When ordering, state as above, whether a full set, or a set of 12, or small set of 8, is wanted.

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

**G. W. LE COUNT, MANUFACTURER, SO. NORWALK, CONN., U. S. A.**

These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England.



After.

## Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES**, giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

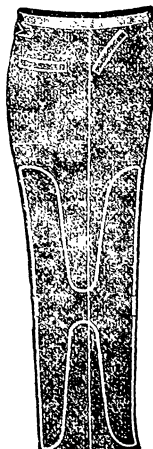
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

**COVERT MFG. CO., West Troy, N. Y.**



**P. F. BURKE, C. F. BURKICK & CO.**  
Manufacturers of  
**PATENT STEEL**  
(Blunt and Sharp)  
**TOE-CALKS.**  
—ALSO—  
BURKE'S IMPROVED  
HORSESHOERS'  
FOOT VICE.  
Send for Circulars.  
360 Dorchester Av. Die for Welding  
BOSTON, MASS. Sharp Calks.

## Crescent

Horse and Mule Shoes,  
BAR IRON.

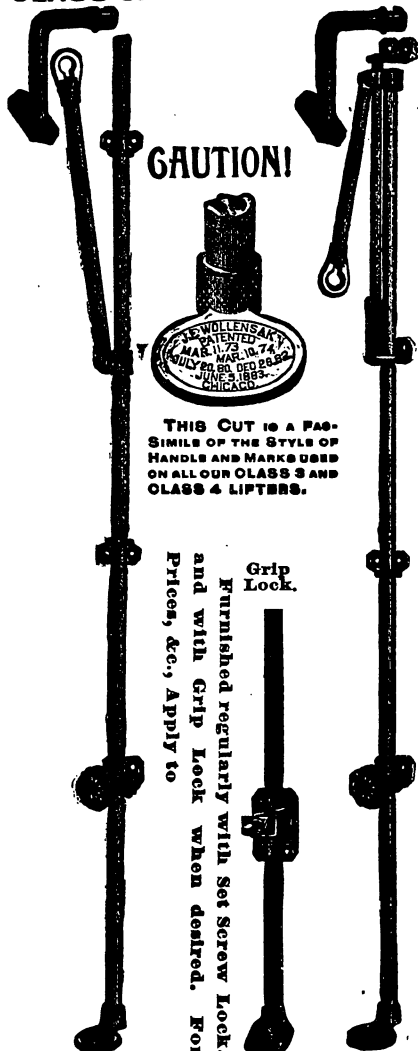
**CRESCENT HORSE SHOE**  
**IRON CO.**

Max Meadows, Va.

**FROST'S ANTI-RATTLER**  
Pat. Jan. 20, 1880.  
Cut One-half Size.  
Sample pair sent to any hardware or saddlery firm by addressing  
**The Frost Thill Spring Co.,**  
Boston, Mass.

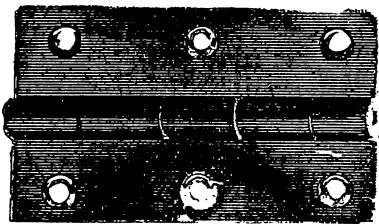
**THE WILCOX & HOWE COMPANY,**  
BIRMINGHAM, CONN.  
MANUFACTURERS OF  
A Full Line of Carriage Hardware

Bicycle and other Drop Forgings of every description made to order.  
Estimates cheerfully given. Send for Catalogue.

**Transom...Lifters****OLD RELIABLE****J. F. WOLLENSAK'S PATENT.****CLASS 3.****CLASS 4.****CAUTION!**

THIS CUT IS A FA-  
SIMILE OF THE STYLE OF  
HANDLES AND MARKS USED  
ON ALL OUR CLASS 3 AND  
CLASS 4 LIFTERS.

Furnished regularly with Set Screw Lock,  
and with Grip Lock when desired. For  
Prices, &c., Apply to

**Grip  
Lock.****J. F. WOLLENSAK, - CHICAGO, ILL****Cast Brass Butt Hinges**

IN STOCK AND FOR SALE BY

**W. & J. TIEBOUT.**

Nos. 16 &amp; 18 Chambers Street, New York,

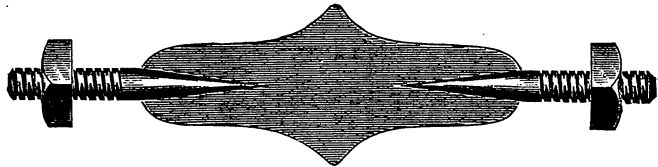
MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.****HIGHEST AWARD.****ALWAYS PLEASE.****ALWAYS SELL.**

NO OTHER SASH LOCK IS SO WELL  
UNDERSTOOD OR APPRECIATED  
BY ARCHITECTS.

**RICHARD ECCLES,****AUBURN, N. Y.,**

—MANUFACTURER OF—

**CARRIAGE FORGINGS,****Couplings, Clips, King Bolts, Fifth Wheels, &c.****SEND FOR SUPPLEMENT TO CATALOGUE.**

Showing a full line of Axle Clips, Spring Bar Clips  
and Three Piece Saddle Clips.

**SEND FOR CATALOGUE AND SUPPLEMENT.****SASH WEIGHTS!****NORTON BROTHERS,**

Manufacturers,

**Office: 813 Masonic Temple, CHICAGO.**

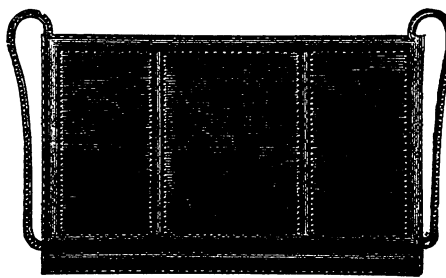
WORKS AT MAYWOOD, ILL.

**McKinnon Dash and Hdw. Co., Ltd.,**

MANUFACTURERS OF

**Dashes,  
Fenders****Roll Up Straps,****Prop Block****Washers**

and

**Shaft Leathers.**

Largest Capacity in  
the World.

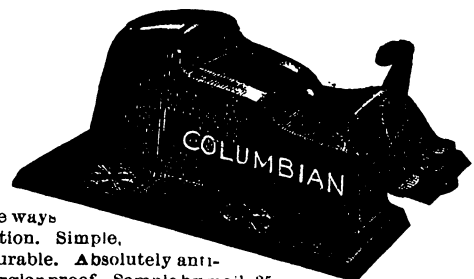
FACTORIES AT

**Buffalo, N. Y.,****Columbus, O.,****St. Catharines, Ont..**

STORE AT

**Cincinnati, O.**

"A" PATTERN.

**Columbian****Sash****Lock.**

Locks three ways  
with one motion. Simple,  
strong and durable. Absolutely anti-  
rattle and burglar proof. Sample by mail, 35c

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This Wrench can be furnished with Short Nut.

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Case-Hardened Throughout. Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the requisite combinations of a regular Nut Wrench, thus making a combination which has no equal. For Circulars and Price-List, address

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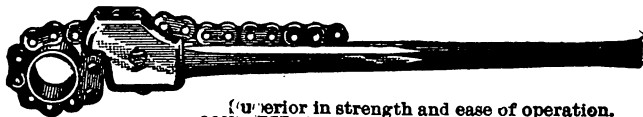
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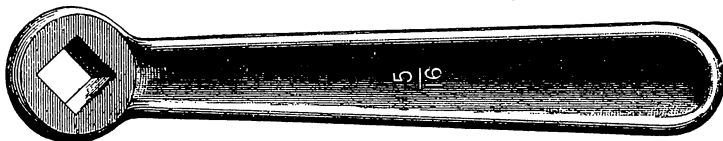
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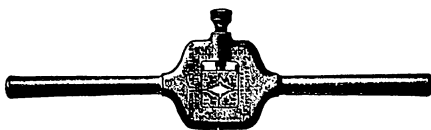
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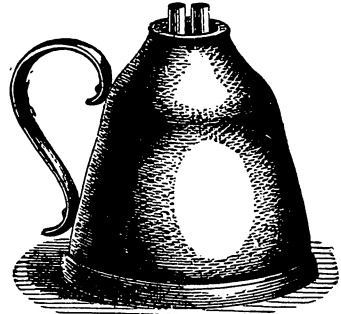
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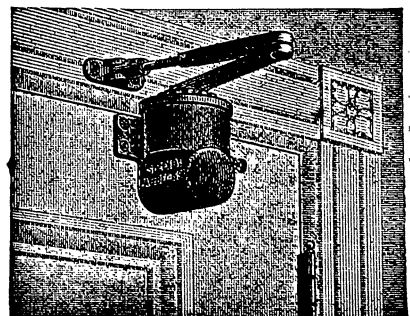
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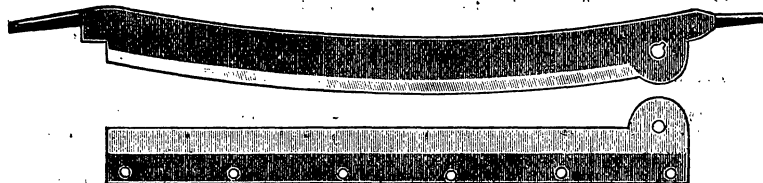
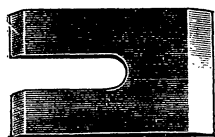
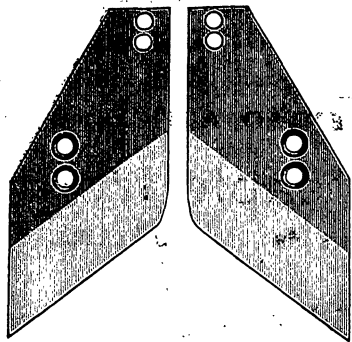
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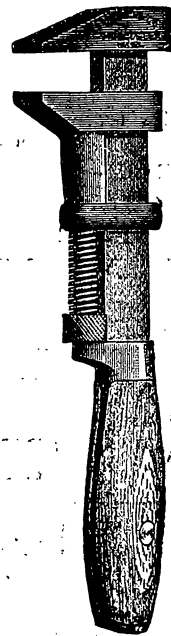
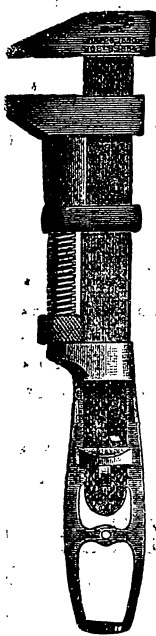


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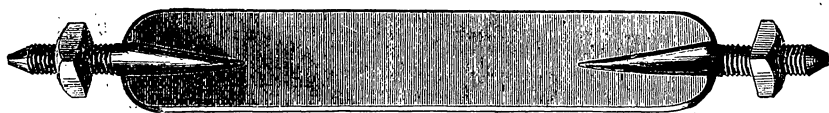
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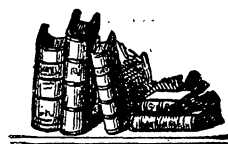
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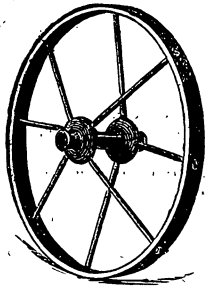
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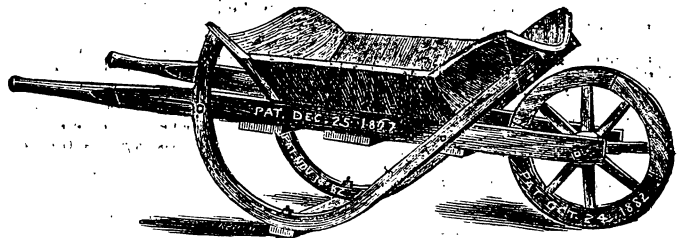


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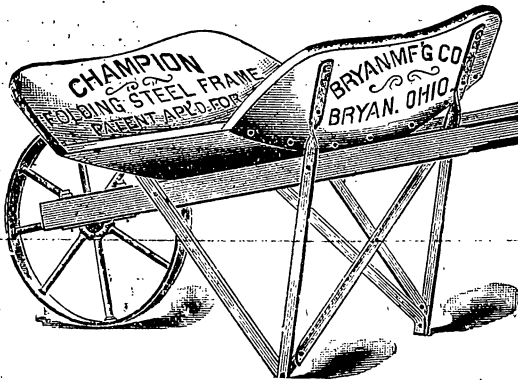
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Occupies Space  
3 inches x 5 inches x 60 inches.

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You had a good thing to sell.  
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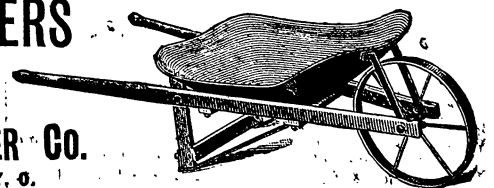
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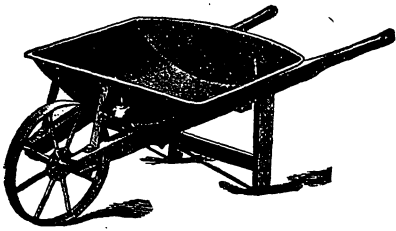
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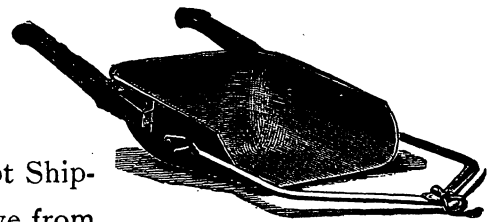


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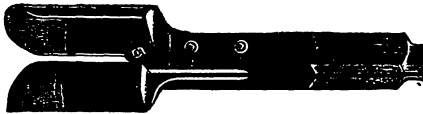


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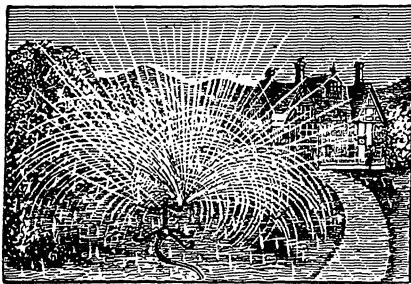
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Lawn Sprinkler.

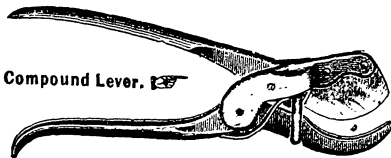


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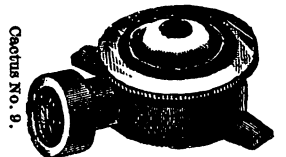
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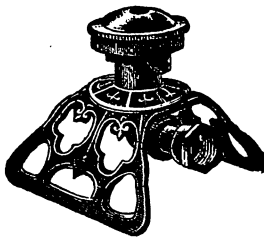
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We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.



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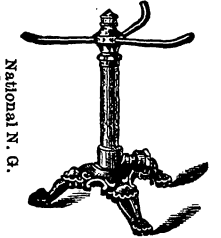
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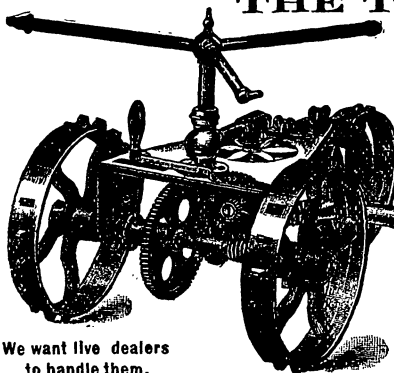
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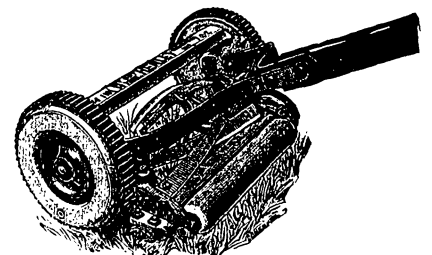


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For Lawns and Parks

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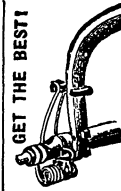
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"It is the only machine I ever had that worked perfectly in every way."

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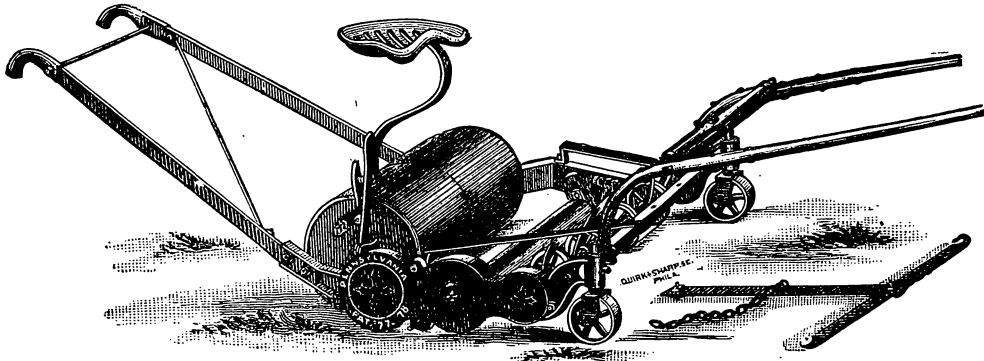
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Made in  
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Almost  
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Wheels, 8 Inches High. Cutter, 5½ Inches Diameter.

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If you wish a first-class Mower in all respects, one that is fully warranted,

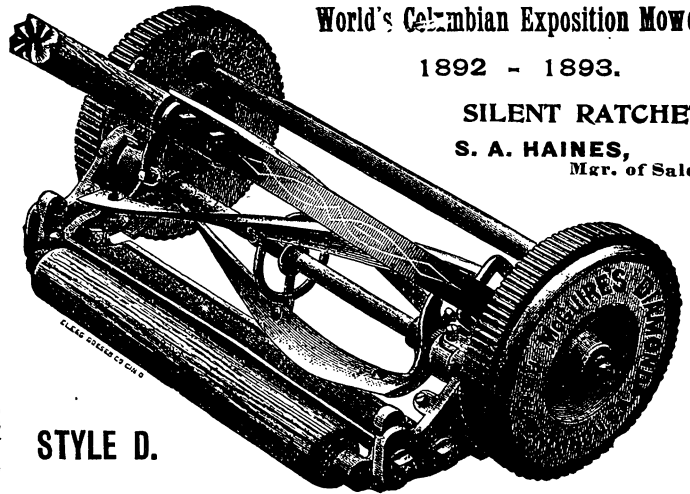
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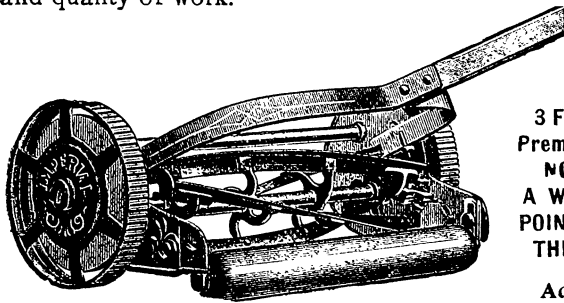
STYLE D.

**COLDWELL LAWN MOWER CO.,**  
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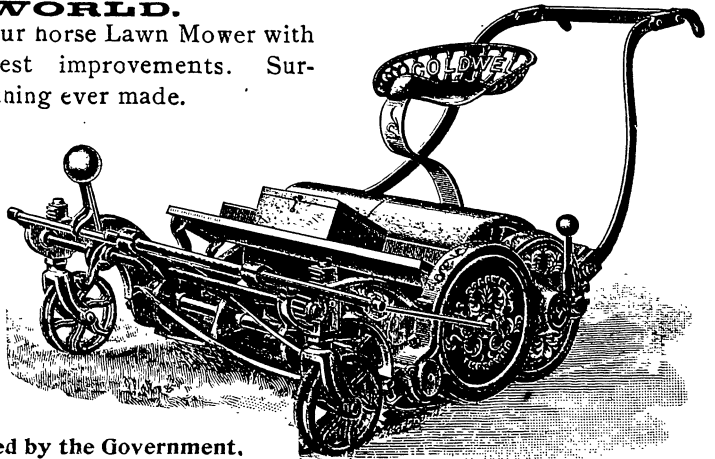
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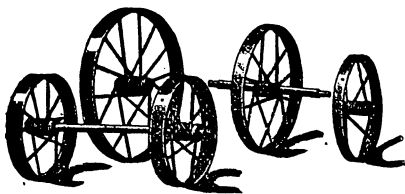


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Adopted by the Government.

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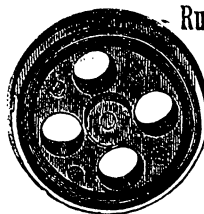


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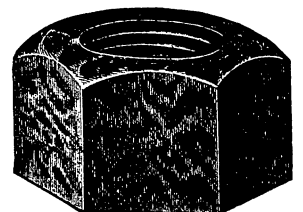
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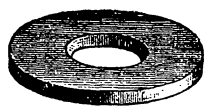
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Automatic Cold Press Nut Machines.

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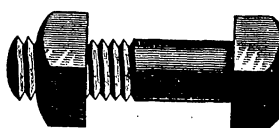
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Every washer *flat*, with hole in *true center*. Sold in 200 lb. kegs, or 1 and 5 lb. paper boxes.

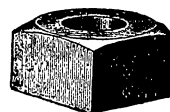
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Machine  
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Hot pressed  
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Stamped to size. Guaranteed extra quality.  
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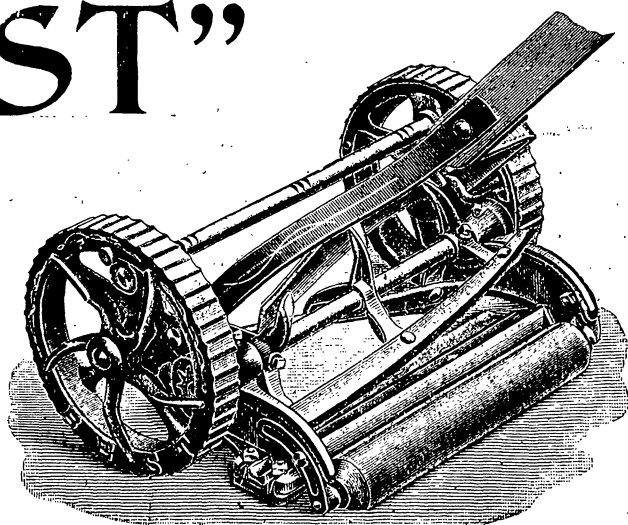
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## LAWN MOWER.

All wearing parts in sight and easy to get at for oiling. Made of the highest grade of material throughout, and is by far the best low priced machine on the market to-day.

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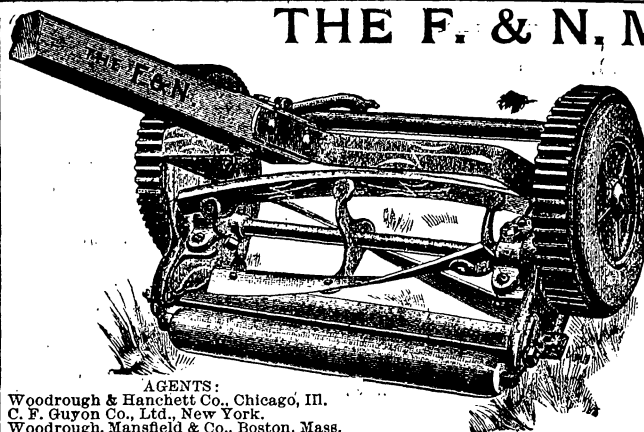
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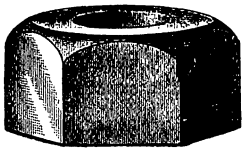


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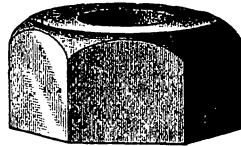
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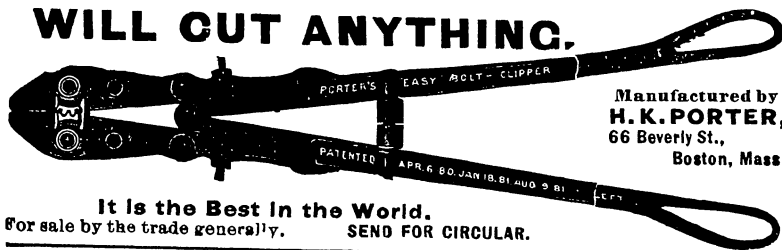
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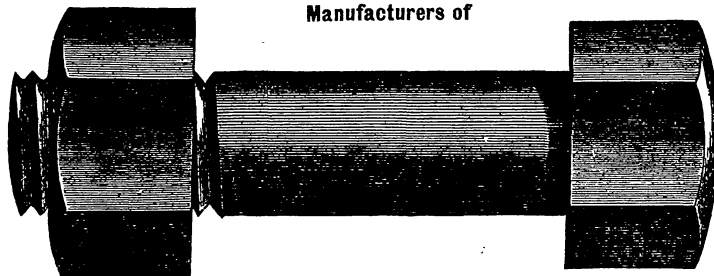
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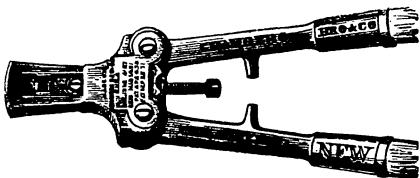
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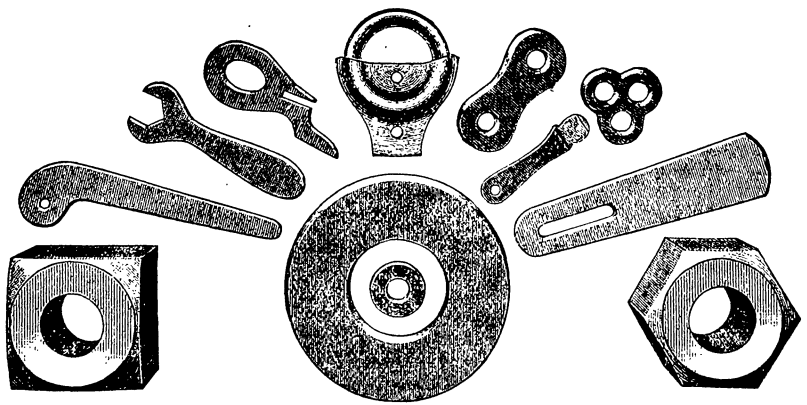
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Hanson &amp; Van Winkle Co., Newark, N. J.

**Elevators, Makers of.**Link-Belt Engineering Co., Phila., Pa.  
Morris, Elevator & Co., Phila., Pa.  
Penna. Elevator Engineering Co., Phila., Pa.  
Variety Machine Co., Warsaw, N. Y.  
Warner Elevator Mfg. Co., Cincinnati, Ohio.**Emery and Emery Wheels.**N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Sterling Emery Wheel Co., 174 Fulton St., N. Y.  
Tanite Co., Stroudsburg, Pa.**Emery Wheel Dressers.**

Bay State Stamping Co., Worcester, Mass.

**Engines and Contractors.**Aiken, Henry, Pittsburgh, Pa.  
Artificial Gas Engineering Co., Pittsburgh, Pa.  
Herrick, J. A., 284 Pearl St., N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. R., Co., Pittsburgh, Pa.  
McCure, Amos, Co., Pittsburgh, Pa.  
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.**Engines, Gas and Gasoline.**Buckeye Mfg. Co., Union City, Ind.  
Otto Gas Engine Works, Phila., Pa.  
Rollason, Gas Engine, Havemayer Bldg., N. Y.  
Springfield Gas Engine Co., Springfield, Ohio.**Engines, Steam, Makers of.**Bass Foundry & Machine Works, Ft. Wayne, Ind.  
Chandler & Taylor Co., Indianapolis, Ind.  
Harris, Wm. A. Steam Engine Co., Providence, R. I.  
Lane & Bodley Co., Cincinnati, Ohio.  
Norwalk Iron Works Co., So. Norwalk, Conn.  
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.  
Phila. Engineering Works, Phila., Pa.  
Southward Foundry & Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Wetherill, Robt. & Co., Chester, Pa.**Exhaust Tumblers.**

Sweetser, W. A., Brockton, Mass.

**Expansion Bolts.**Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.  
Steward & Romaine Mfg. Co., Phila., Pa.**Exporters.**

Flint &amp; Co., 68 Broad St., N. Y.

**Faucets, Self-Measuring.**

Lane Bros., Poughkeepsie, N. Y.

**Faucets, Wooden, Makers of.**

John Sommer's Son, Newark, N. J.

**Feed-Water Heaters and Fitters.**Davis, I. B. & Son, Hartford, Conn.  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Works, Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Elmwood, Conn.**Fencing, Iron and Wire.**Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Clinton Wire Cloth Co., Clinton, Mass.  
Hilbert & Bennett Mfg. Co., 42 Cliff St., Kilmear Mfg. Co., Newburgh, N. Y.  
McCallip Fence & Wire Wks., Columbus, Ohio.  
Randall Fence Co., Le Roy, N. Y.  
The Van Dorn Iron Works Co., Cleveland, O.  
Wire Fence Supply Co., Indianapolis, Ind.**Files, Importers of.**

Moss, F. W., 80 John St., N. Y.

**Files and Rasps, Manufacturers of.**Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & H., 41 & 43 Richmond, Phila.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.**Fire Brick, Makers of.**Borgner, Cyrus, Philadelphia, Pa.  
Gardner, Jas. & Son, Cumberland, Md.  
Kreischer, B. & Sons Foot E. Houston St., N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro. Co., Woodbridge.**Fire Doors.**Berlin Iron Bridge Co., E. Berlin, Conn.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.**Fishing Tackle.**

Dane, Stoddard &amp; Kendall, Boston, Mass.

**Flint and Emery Paper.**

Baeder, Adamson &amp; Co., Phila., Pa.

**Flour Sifters.**

Bromwell Brush &amp; Wire Goods Co., Cincinnati, Ohio.

Meyers, Fred, J. Mfg. Co., Hamilton, O.

**Fodder Cutters.**

Silver Mfg. Co., Salem, O.

**Forges, Portable, &c.**Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Foos Mfg. Co., Springfield, Ohio.  
Sturtevant, B. F. Co., Boston, Mass.**Forgings, Iron and Steel.**Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel-Cambria Iron Co., Johnstown, Pa.  
Frankford Steel Co., Phila., Pa.  
Scranton Forging Co., Scranton, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.**Forks, Hay and Manure.**

Iowa Farming Tool Co., Ft. Madison, Iowa

**Foundry Facings.**Dixon, Jos., Crucible Co., Jersey City, N. J.  
S. Obermayer Co., Cincinnati, O.  
Smith, J. D., Fdy. Supply Co., Cin., O.**Foundry Riddles.**

Estey, W. S., 65 Fulton, N. Y.

**Foundry Supplies.**Diamond Clamp & Flask Co., Richmond, Ind.  
S. Obermayer Co., Cincinnati, O.  
Rice Mfg. Co., New Durham, N. H.  
Smith, J. D., Fdy. Supply Co., Cin., O.**Friction Clutches.**Brown, A. & F., 17 Dey St., N. Y.  
Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.**Friction Cone.**

Evans Friction Cone Co., Boston, Mass.

**Furnaces, Foundry.**

Byram &amp; Co., Detroit, Mich.

**Galvanized Material.**

Jersey City Galvanizing Co., 112 John St., N. Y.

**Gas Producers.**

Wood, R. D. &amp; Co., Philadelphia, Pa.

**Gas & Steam Fitters' Supplies.**

Fancoast, Henry B. &amp; Co., Phila., Pa.

**Gate Hinges.**

Wrightsville Hdw. Co., Wrightsville, Pa.

**Gauge, Rolling Mill.**

Haines Gauge Co., Philadelphia, Pa.

**Gear Cutters.**

D. E. Whiton Mach. Co., New London, Conn.

**Gears.**Boston Gear Works, Boston, Mass.  
Lincoln Iron Works, Rutland, Vt.  
Pole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.**Glass Boards.**

Canton Saw Co., Canton, O.

**Glass Cutters.**

Lufkin Rule Co., Saginaw, Mich.

**Glue.**Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russell Cement Co., Gloucester, Mass.**Grass Catchers.**

Supplee Hardware Co., Phila., Pa.

**Grinding Mills.**

Foos Mfg. Co., Springfield, O.

**Grinding and Polishing Machines.**Herrick & Cowell, New Haven, Conn.  
Norton Emery Wheel Co., Worcester, Mass.**Grindstone Dressing Machinery.**

Blake &amp; Johnson, Waterbury, Conn.

**Grindstones.**

Cleveland Stove Co., Cleveland, O.

**Gun Implements.**

Union Hdw. Co., Torrington, Conn.

**Gunpowder, Makers of.**

Lafin &amp; Rand Powder Co., 29 Murray St., N. Y.

**Hammocks.**

Eustis, Jas. W. Co., Boston, Mass.

**Handles.**

Cleveland Wood Turning Co., Cleveland, O.

**Hangers, Door.**

Chicago Spring Butt Co., Chicago, Ill.

**Hardware Comm'n Merchants.**

Graham, John H. &amp; Co., 111 Chambers St., New York.

**Hardware Manufacturers.**Russell & Erwin Mfg. Co., Chambers St., New York.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. B. & Co., Groton, N. Y.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.**Hardware Mfrs.' Agents.**Bingham, W. Co., Cleveland, O.  
Clarke, Thomas, St. John, N. B.  
Graham, John H. & Co., 111 Chambers, Sickles, Sweet & Lyon, 35 Barclay, N. Y.**Hardware Specialties.**Acme Shear Co., Bridgeport, Conn.  
Burger Bros., Philadelphia, Pa.  
Bourke Mfg. Co., Youngstown, O.  
Clark Mfg. Co., Buffalo, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gwinner Mfg. Co., Hamilton, O.  
Johnson, S. C., Racine, Wis.North Bros. Mfg. Co., Philadelphia, Pa.  
Ransom Hdw. Co., Burlington, Vt.  
Scranton & Co., New Haven, Conn.  
Wilson, J. Fred, Worcester, Mass.  
Wrightsville Hdw. Co., Wrightsville, Pa.**Harness Snaps.**Covert Mfg. Co., West Troy, N. Y.  
Coverts' Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.**Hog Rings and Ringers.**

Oakes &amp; Irwin, Decatur, Ill.

**Hoisting Machines.**Box, Alfred & Co., 314 Green, Phila.  
Brown, Hoisting & Conveying Mch. Co., Cleveland, Ohio.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E. Son & Co., Phila.  
Lane Bros., Poughkeepsie, N. Y.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
McCoy, Jos. F. & Co., 26 Warren St.  
Marls & Beekley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Speidel, G. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.**Hollow Ware.**Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.**Horse Nails, Makers of.**Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.**Horse and Mule Shoes, Makers of.**Bryden Horse Shoe Co., Catsaugua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Diamond State Iron Co., Wilmington, Del.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.**Hose Menders.**

Hudson, C. E. &amp; Co., Leominster, Mass.

**Hose.**Cleveland Rubber Works, Cleveland, O.  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.**Hydrants, &c.**

McLean, John, 206 &amp; 208 Monroe, N. Y.

**Hydraulic Forging.**

U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.**

Dudgeon, Richard, 24 Columbia, N. Y.

**Ice Cream Freezers.**North Bros. Mfg. Co., Phila., Pa.  
Packer, C. W., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua, N. H.**Injectors.**Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.  
Sherwood Mfg. Co., Buffalo, N. Y.**Insurance, Boiler.**

Hartford Steam Boiler Inspection &amp; Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**

Lundberg, Gustaf, Boston, Mass.

**Iron Commission Brokers.**Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lee, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.**Iron Ore.**

Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.**Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Bussellus & Cunliffe, Philadelphia.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.  
Pierson & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 66 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.**Iron, Importers.**Abbott, Wheelock & Co., N. Y. and Boston.  
Lundberg, Gustaf, Boston, Mass.**Iron, Sheet, Manufacturers of.**Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Lim., McKeesport, Pa.**Ironwork, Ornamental.**Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.**Juice Extractors.**

Sterling Aluminum Co., Brooklyn, N. Y.

**Keys.**

Wollensak, J. F., Chicago, Ill.

**Ladles.**

Whiting Fdy. Equipment Co., Chicago, Ill.

**Lamps.**

Standard Lighting Co., Cleveland, O.

**Lanterns.**Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.**Lathes.**Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.  
New Haven Mfg. Co., New Haven, Conn.  
Sebastian Lathe Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.**Lathing, Expanded Metal.**

Chess Bros., Pittsburgh, Pa.

**Lathing, Wire.**Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.**Lawn Mowers.**Anderson, F. S. & Co., Richmond, Ind.  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
Enterprise Mfg. Co., Philadelphia, Pa.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.  
Supplee Hdw. Co., Phila., Pa.**Lawn Rakes.**

Gibbs Mfg. Co., Canton, Ohio.

Kohler, F. E. &amp; Co., Canton, O.

**Lawn Sprinklers.**Blair Mfg. Co., Springfield, Mass.  
Enterprise Mfg. Co., Phila., Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Graham, John H. & Co., 113 Chambers Street, N. Y.  
McGowan, John H. Co., Cincinnati, O.  
Portland Lawn Sprinkler Co., Portland, Me.**Letters and Figures, Metallic.**

White, A. A. &amp; Co., Providence, R. I.

**Letters, Paper.**

Tablet &amp; Ticket Co., Chicago, Ill.

**Levels.**

Richardson, C. F. &amp; Son, Athol, Mass.

**Locks and Knobs, Manufacturers of.**Deitz, A. E., 97 Chambers, N. Y.  
Independent Electric Co., Chicago, Ill.  
Reading Hdw. Co., Reading, Pa.  
Romer & Co., Newark, N. J.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Yale & Towne Mfg. Co., Stamford, Conn.**Lubricants.**

Dixon, Jos., Crucible Co., Jersey City, N. J.

**Machinery.**Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Dey, N. Y.  
Bignall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Bridgeport Mch. Tool Works, Bridgeport, Conn.  
Briggs, Marvin, 12 Broadway, N. Y.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Laight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Henderer, A. L., Wilmington, Del.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Hubert-Rogers Mch. Co., South Sudbury, Mass.  
Johnson, Israel H., Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
Lovegrove & Co., Philadelphia, Pa.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinists' Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Place, Geo.**, 145 Broadway, N. Y.  
**Pole, Robt. & Son Co.**, Baltimore, Md.  
**Powell Place Co.**, Worcester, Mass.  
**Prentiss Tool & Supply Co.**, N. Y.  
**Scranton Supply & Machinery Co.**, Scranton, Pa.  
**Sellers, Wm. & Co.**, Phila.  
**Seyfert's Sons, L. F.**, Philadelphia, Pa.  
**Sigourney Tool Co.**, Hartford, Conn.  
**Steppe, J. & Co.**, Cincinnati, O.  
**Stow Flexible Shaft Co., Ltd.**, Phila.  
**Toomey, Frank**, Philadelphia, Pa.  
**Walker Mfg. Co.**, Cleveland, O.  
**Wetherill, Robert & Co.**, Chester, Pa.  
**Wilson, W. A.**, Rochester, N. Y.
- Machinery for Hardware Manufacturers.**  
**Adt, Jno. & Son**, New Haven, Conn.
- Machine Knives.**  
**Loring, Coes & Co.**, Worcester, Mass.  
**Loyd, John**, 558-562 Water St., N. Y.  
**Simonds Mfg. Co.**, Fitchburg, Mass.  
**New Britain Edw. Mfg. Co.**, New Britain, Conn.
- Machine Tools.—See Machinery.**
- Machine Work.**  
**Papping, J.**, 55th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**  
**Coffin & Leighton**, Syracuse, N. Y.  
**Starrett, L. S.**, Athol, Mass.
- Machinists' Tools and Supplies.**  
**King, J. M. & Co.**, Watford, N. Y.  
**Sellers, Wm. & Co., Inc.**, Phila.
- Manufacturing Sites.**  
**Illinois Central R. R.**, Chicago, Ill.
- Measuring Tapes.**  
**Keuffel & Esser Co.**, N. Y.  
**Lufkin Rule Co.**, Saginaw, Mich.
- Meat Choppers.**  
**Clauss Shear Co.**, Fremont, Ohio.
- Mechanical Instruction.**  
**Correspondence School of Mechanics**, Scranton, Pa.
- Merry-go-round.**  
**Clark, W. J. & Co.**, Salem, Ohio.
- Metals.**  
**Fearing, Wm. S.**, 100 Chambers, N. Y.  
**Hendricks Bros.**, 49 Cliff, N. Y.
- Metal Brokers.**  
**American Metal Co.**, N. Y.
- Metallic Ceilings.**  
**Penn. Iron Roofing & Corrugating Co.**, Phila., Pa.
- Metalurgists.**  
**Britton, J. Blodgett**, Phila., Pa.
- Mining Knives.**  
**Palmer Ldw. Mfg. Co.**, Troy, N. Y.
- Mine Lamp.**  
**Darby, Edw. & Sons**, Phila., Pa.  
**Leonard, B. E.**, Scranton, Pa.
- Mining Screens.**  
**Harrington & King Perforating Co.**, Chicago, Ill.  
**Howard & Morse**, 45 Fulton, N. Y.
- Models, Makers of.**  
**Franklin, H. H. Mfg. Co.**, Syracuse, N. Y.  
**Ideal Machine Works**, Hartford, Conn.
- Molding Sand.**  
**Obernayer, S. Co.**, Cincinnati, O.
- Money Drawers.**  
**Columbian Novelty Co.**, North East, Penna.  
**Sun Mfg. Co.**, Greenfield, Ohio.  
**Wadell Wooden Ware Wks.**, Greenfield, Ohio.
- Motors, Water and Electric.**  
**Bolgiano Mfg. Co.**, Baltimore, Md.  
**C. & C. Electric Co.**, 402 and 404 Greenwich St., N. Y.  
**Dallett, Thomas H. & Co.**, Phila., Pa.
- Nail Keg Stock.**  
**Crescent Mfg. Co.**, Detroit, Mich.
- Nail Machinery.**  
**Pittsburgh Mfg. Co.**, Pittsburgh, Pa.
- Nail and Tack Pullers.**  
**Scranton & Co.**, New Haven, Conn.  
**Specialty Mfg. Co.**, Hartford, Conn.
- Nails (Cut) and Spikes.**  
**Borden & Lovell**, 70 West, N. Y.  
**Pottstown Iron Co.**, Pottstown, Pa.  
**Riverside Iron Wks.**, Wheeling, W. Va.  
**Valley Steel Co.**, St. Louis, Mo.
- Nickel Platers' Supplies.**  
**Eddy Electric Mfg. Co.**, Windsor, Conn.  
**Hanson & Van Winkle Co.**, Newark, N. J.  
**Zucker & Levett Chemical Co.**, 10 to 14 Grand St., N. Y.
- Nickel Plating.**  
**Rhodes, L. E. Co.**, Hartford, Conn.
- Norway Shapes, Rollers of.**  
**Rowland, William & Harvey**, Frankford, Philadelphia.
- Novelty Manufacturers.**  
**Franklin, H. H. Mfg. Co.**, Syracuse, N. Y.  
**Ideal Machine Works**, Hartford, Conn.
- Nut Machines.**  
**Dunham Nut Co.**, Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**  
**American Bolt Co.**, Lowell, Mass.  
**American Screw Co.**, Providence, R. I.  
**Blake & Johnson**, Waterbury, Conn.  
**Dunham Nut Co.**, Unionville, Conn.  
**Haskell, Wm. H. Co.**, Pawtucket, R. I.  
**Mt. Carmel Bolt Co.**, Mt. Carmel, Conn.  
**Pennsylvania Bolt & Nut Co.**, Lebanon, Pa.  
**Port Chester Bolt & Nut Co.**, Port Chester, N. Y.  
**Russell, Burdall & Ward**, Port Chester, N. Y.  
**Sternberg, J. H. & Son**, Reading, Pa.  
**Wilson, J. Fred.**, Worcester, Mass.  
**Wm. H. Haskell Co.**, Pawtucket, R. I.
- Oil Cups and Lubricators.**  
**Sherwood Mfg. Co.**, Buffalo, N. Y.
- Oilers.**  
**Wilnot & Hobbs Mfg. Co.**, Bridgeport, Conn.
- Oil Stones.**  
**Pike Mfg. Co.**, Pike Station, N. H.
- Orange Shears.**  
**Henry, J. T. Mfg. Co.**, Hamden, Conn.
- Ores.**  
**Wister, Francis**, Philadelphia, Pa.
- Ox Shoes.**  
**Scranton Forging Co.**, Scranton, Pa.
- Packing.**  
**Morrison, Robert**, St. Louis, Mo.  
**N. Y. Belting & Packing Co., Ltd.**, N. Y.
- Padlocks.**  
**Ames Sword Co.**, Chicopee, Mass.  
**Fram, E. T.**, Lancaster, Pa.  
**Independent Electric Co.**, Chicago, Ill.  
**Wolf, W. & L.**, Phila., Pa.
- Paint.**  
**Garry Iron & Steel Roofing Co.**, Cleveland, O.
- Paint Burners.**  
**Dangler Stove & Mfg. Co.**, Cleveland, Ohio.
- Paint Cans.**  
**Wilnot & Hobbs Mfg. Co.**, Bridgeport, Conn.
- Pants Stretcher.**  
**Covert Mfg. Co.**, West Troy, N. Y.
- Patent Solicitors.**  
**Butler, C. N.**, Phila., Pa.  
**Jenner, H. W. T.**, Washington, D. C.  
**Howson & Howson**, Philadelphia and Washington.  
**Stocking, E. B.**, Washington, D. C.
- Pattern Letters.**  
**Wells, Heber**, 157 William St., N. Y.
- Perforated Metal.**  
**Clinton Wire Cloth Co.**, Clinton, Mass.  
**Harrington & King Perforating Co.**, Chicago, Ill.  
**Hendrick Mfg. Co., Ltd.**, Carbondale, Pa.
- Phosphor Bronze.**  
**Phosphor Bronze Smelting Co., Limited**, Philadelphia.
- Phosphor Tin.**  
**Crescent Phosphorized Metal Co.**, Philadelphia, Pa.  
**Halk & Naumann**, 516 Pearl, N. Y.
- Picks and Mattocks.**  
**Plumb, Fayette R.**, Philadelphia, Pa.
- Pig Iron.**  
**Bousten, C. B. & Co.**, Philadelphia, Pa.  
**Montour Iron & Steel Co.**, Danville, Pa.  
**Naylor & Co.**, 45 Wall, N. Y.  
**Pilling & Crane**, Philadelphia, Pa.  
**Samuel, Frank**, Philadelphia, Pa.
- Pig Iron Storage.**  
**Am. Pig Iron Storage Warrant Co.**, 44 Wall, N. Y.
- Pile Drivers.**  
**Vulcan Iron Works**, Chicago, Ill.
- Pipe, Bent.**  
**National Pipe Bending Co.**, New Haven, Conn.
- Pipe Cutting and Threading Machines.**  
**Armstrong Mfg. Co.**, Bridgeport, Conn.  
**Signal & Keeler Mfg. Co.**, St. Louis, Mo.  
**Detrick & Harvey Mch. Co.**, Baltimore, Md.  
**Merrill Mfg. Co.**, Toledo, O.  
**Pancoat, Henry B. & Co.**, Phila.  
**Saunders' Sons, D.**, Yonkers, N. Y.  
**Walworth Mfg. Co.**, Boston, Mass.
- Pipe Grips.**  
**Prentiss Vise Co.**, 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**  
**McNab & Harlin Mfg. Co.**, N. Y.
- Pipe, Water and Gas, Makers of.**  
**Donaldson Iron Co.**, Emaus, Pa.  
**Riverside Iron Works**, Wheeling, W. Va.  
**Wood, R. D. & Co.**, Philadelphia, Pa.
- Plane Irons, Manufacturers of.**  
**Buck Bros.**, Millbury, Mass.  
**Buck, Chas.**, Millbury, Mass.
- Planers.**  
**Detrick & Harvey Mch. Co.**, Baltimore, Md.  
**New Haven Mfg. Co.**, New Haven, Conn.  
**Powell Planer Co.**, Worcester, Mass.  
**Wilson, W. A.**, Worcester, Mass.
- Planes, Manufacturers of.**  
**Stanley Rule & Level Co.**, N. Y.
- Plated Ware.**  
**Boardman, L. & Son**, New Haddam, Ct.  
**Holmes & Edwards Silver Co.**, Bridgeport, Conn.  
**Rogers, Wm. Mfg. Co.**, Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**  
**Esna-Standard Iron & Steel Co.**, Bridgeport, O.  
**Chees Bros.**, Pittsburgh, Pa.  
**Lukens Iron & Steel Co.**, Coatesville, Pa.  
**Mahoning Valley Iron Co.**, Youngstown, Ohio.  
**Moorehead-McLean Co.**, Pittsburgh, Pa.  
**McIlvaine & Sons**, Reading, Pa.  
**Pottstown Iron Co.**, Pottstown, Pa.  
**Pottsville Iron & Steel Co.**, Pottsville, Pa.  
**Singer, Nimick & Co.**, Pittsburgh, Pa.  
**The Mahoning Valley Iron Co.**, Youngstown, O.  
**Wood, Alan Co.**, Philadelphia.
- Plating, Nickel, Brass and Silver.**  
**Wilnot & Hobbs Mfg. Co.**, Bridgeport, Conn.
- Polishing Machines.**  
**Watson & Stillman**, 204 E. 42d, N. Y.
- Post Hole Diggers.**  
**Gibbs Mfg. Co.**, Canton, Onto.  
**Kohler, F. E. & Co.**, Canton, O.
- Poultry Nettings.**  
**Barnum, E. T.**, Detroit, Mich.  
**Gilbert & Bennett Mfg. Co.**, 42 Cliff St., N. Y.  
**N. J. Wire Cloth Co.**, Trenton, N. J.  
**"Silver Finish"**  
**Tyler Wire Works Co.**, W. S., Cleveland, O.  
**Wright & Colton Wire Cloth Co.**, Worcester, Mass.
- Powder.**  
**Lafin & Rand Powder Co.**, 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**  
**Millers Falls Co.**, 93 Reade St., N. Y.
- Power Hammers.**  
**Dienelt & Eisenhardt**, Philadelphia.  
**Dupont Mfg. Co.**, St. Johnsburg, Vt.  
**Jenkins & Lingle**, Bellefonte, Pa.  
**Miner & Peck Mfg. Co.**, New Haven, Conn.  
**Scranton & Co.**, New Haven, Conn.
- Power Transmitting Machinery.**  
**Dodge Mfg. Co.**, Mishawaka, Ind.
- Presses, Dies, &c.**  
**E. W. Bliss Co.**, Brooklyn, N. Y.  
**Crosby, G. A. & Co.**, Chicago, Ill.  
**Ferracute Mch. Co.**, Bridgeton, N. J.  
**Stark Mch. & Tool Co.**, Buffalo, N. Y.  
**Stiles & Parker Press Co.**, Brooklyn, N. Y.  
**Waterbury Mch. Co.**, Waterbury, Ct.
- Presses, Power, Makers of.**  
**Bliss, E. W. Co.**, Brooklyn, N. Y.  
**Manville, E. J. Mch. Co.**, Waterbury, Ct.  
**Stark Mch. & Tool Co.**, Buffalo, N. Y.  
**Waterbury Farrel Foundry & Machine Co.**, Waterbury, Conn.
- Printers.**  
**Griffith, Axtell & Cady Co.**, Holyoke, Mass.
- Pruning Knives.**  
**Gibbs Mfg. Co.**, Canton, O.
- Pulleys.**  
**Brown, A. & F.**, 17 Day St., N. Y.  
**Dodge Mfg. Co.**, Mishawaka, Ind.  
**Keystone Clutch Mch. Wks.**, Phila., Pa.  
**Reeves Pulley Co.**, Columbus, Ind.
- Pulverizing Mills.**  
**Bradley Fertilizer Co.**, Boston, Mass.
- Pumping Machinery.**  
**Dean Bros. Steam Pump Works**, Indianapolis, Ind.  
**Goulds Mfg. Co.**, Seneca Falls, N. Y.  
**Hooker-Colville Steam Pump Co.**, St. Louis, Mo.  
**Lucas, C. O. & Co.**, Greenville, Ohio.  
**McGowan, J. H. & Co.**, Cincinnati, O.  
**Maslin, J. & Son**, Jersey City, N. J.  
**Norwalk Iron Works Co.**, So. Norwalk, Conn.  
**Southwark Fdy. & Mch. Co.**, Phila., Pa.  
**Valley Pump Works**, Easthampton, Mass.  
**Worthington, Henry R.**, 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**  
**Bellevue Pump Co.**, Bellevue, Iowa.  
**Deming Co.**, Salem, O.  
**Douglas, W. B.**, Middletown, Conn.  
**Goulds Mfg. Co.**, Seneca Falls, N. Y.  
**Myers, F. E. & Bro.**, Ashland, O.
- Punches.**  
**Richards, I. P.**, Providence, R. I.
- Punches and Shears, Hand and Power.**  
**Bertsch & Co.**, Cambridge City, Ind.  
**E. W. Bliss Co.**, Brooklyn, N. Y.  
**Crosby, G. A. & Co.**, Chicago, Ill.  
**Ferracute Mch. Co.**, Bridgeton, N. J.  
**Henderer, A. L.**, Wilmington, Del.  
**Stark Mch. & Tool Co.**, Buffalo, N. Y.  
**Stiles & Parker Press Co.**, Brooklyn, N. Y.  
**Wals & Roos Punch & Shear Co.**, Cincinnati, Ohio.  
**Waterbury Farrel Foundry & Machine Co.**, Waterbury, Conn.  
**Watson & Stillman**, 204 E. 42d, N. Y.
- Rails, Old and New.**  
**Ferry, W. H. & Co.**, Providence, R. I.
- Rat and Mouse Traps.**  
**Estey, W. S.**, 65 Fulton, N. Y.
- Razor Guard.**  
**Murphy, P. D.**, Lockport, N. Y.
- Razor Sharpener.**  
**Dame, Stoddard & Kendall**, Boston, Mass.
- Razorine Mfg. Co.**, 2 W. 14th St., N. Y.
- Razor Strops.**  
**Torrey J. R. & Co.**, Worcester, Mass.
- Reels.**  
**Hendryx, A. B. Co.**, New Haven, Conn.
- Refrigerator Door Fasteners.**  
**Conroy, P. J. & Co.**, Philadelphia.
- Rivers.**  
**Blake & Johnson**, Waterbury, Conn.  
**Boycet Co.**, Muncie, Ind.  
**Burden Iron Co.**, Troy, N. Y.  
**Clark & Cowles**, Plainville, Conn.  
**Cobb & Drew**, Plymouth, Mass.  
**New England Screw Co.**, Boston, Mass.  
**Sternbergh, J. H. & Son**, Reading, Pa.  
**Townsend, W. P. & Co.**, New Brighton, Pa.
- Riveting Machines.**  
**Adt, Jno. & Sons**, New Haven, Conn.
- Rolling Mill Machinery.**  
**Birmingham Iron Fdry.**, Birmingham, Conn.  
**Booth, The Lloyd Co.**, Youngstown, O.  
**Leachburg Foundry & Mch. Co.**, Pittsburgh, Pa.  
**Morgan Construction Co.**, Worcester, Mass.  
**Robinson-Rea Mfg. Co.**, Pittsburgh.  
**Totten & Hogg Iron and Steel Fdry. Co.**, Pittsburgh, Pa.  
**Tretchewy Mfg. Co.**, Pittsburgh, Pa.  
**Waterbury Farrel Foundry & Mch. Co.**, Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**  
**Birmingham Iron Foundry**, Birmingham, Conn.  
**Booth, The Lloyd Co.**, Youngstown, O.  
**East Chicago Fdy. Co.**, Chicago, Ill.  
**Garrison, A. Fdy. Co.**, Pittsburgh, Pa.  
**Robinson-Rea Mfg. Co.**, Pittsburgh, Pa.  
**Seaman, Sleeth & Black**, Pittsburgh.  
**Totten & Hogg Iron and Steel Fdry. Co.**, Pittsburgh, Pa.
- Roofing.**  
**Berlin Iron Bridge Co.**, E. Berlin, Conn.  
**Cambridge Roofing Co.**, Cambridge, O.  
**Inchinnat Corrugating Co.**, Piqua, O.  
**Kanneberg Roofing Co.**, Canton, O.  
**N. Y. Iron Roofing & Corrugating Co.**, Jersey City, N. J.
- Rope and Web Goods.**  
**Covert Mfg. Co.**, West Troy, N. Y.  
**Covert's Saddlery Wks.**, Farmer, N. Y.
- Rope Wheels.**  
**Cresson, Geo. V. Co.**, Philadelphia, Pa.
- Rubber Goods.**  
**Cannfield, H. O.**, Bridgeport, Conn.
- Rules, Manufacturers of.**  
**Keuffel & Esser Co.**, New York.  
**Lufkin Rule Co.**, Saginaw, Mich.  
**Stanley Rule & Level Co.**, 29 Chambers.
- Rust Preventive.**  
**Bridgeport Gun Implement Co.**, 318-345 Broadway, N. Y.
- Sad Irons.**  
**Streeter, N. R. & Co.**, Groton, N. Y.
- Sad Irons, Gas.**  
**Bolgiano Mfg. Co.**, Baltimore, Md.
- Sample Holder.**  
**Massey & Thompson**, Monroe City, Mo.
- Sand Paper.**  
**Baeder, Adamson & Co.**, Phila., Pa.
- Sash Balances.**  
**Caldwell Mfg. Co.**, Rochester, N. Y.  
**Pullman Sash Balance Co.**, Rochester, N. Y.
- Sash Cords and Chains.**  
**Morton, Thos.**, 65 Elizabeth, N. Y.  
**Ossawan Mills Co.**, Norwich, Conn.  
**Samson Cordage Works**, Boston, Mass.  
**Smith & Egge Mfg. Co.**, Bridgeport.
- Sash Fasteners.**  
**Woolster, F. V.**, Boston, Mass.
- Sash Locks.**  
**Columbian Sash & Door Lock Co.**, Wauseon, Ohio.
- Sash Pulleys.**  
**Palmer Hardware Mfg. Co.**, Troy, N. Y.
- Sash Weights.**  
**Brown, E. E. & Co.**, Philadelphia, Pa.  
**Norton Bros.**, Chicago, Ill.
- Saw Filing Machines.**  
**Disston, Henry & Sons**, Philadelphia, Pa.
- Saws, Makers of.**  
**Butler Mfg. Co.**, Boston, Mass.  
**Disston, Henry & Sons**, Phila., Pa.  
**National Saw Co.**, 96 Reade St., N. Y.  
**Simonds Mfg. Co.**, Fitchburg, Mass.
- Saw Vises.**  
**Seneca Falls Mfg. Co.**, Seneca Falls, N. Y.
- Saw Sets.**  
**Talutor Mfg. Co.**, 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**  
**Buffalo Scale Co.**, Buffalo, N. Y.  
**Chatillon, John & Sons**, 85-89 Cliff, N. Y.
- Scrapers, Road.**  
**Am. Steel Scraper Co.**, Sydney, Ohio.  
**Kilbourne & Jacobs Mfg. Co.**, Columbus, O.  
**Sidney Steel Scraper Co.**, Sidney, O.
- Screens, Coal and Ore.**  
**Hendrick Mfg. Co., Ltd.**, Carbondale, Pa.
- Screens, Door and Window.**  
**White, Van Gahn & Co.**, 15-17 Chatham Sq., N. Y.
- Screw Cutting Machinery.**  
**Wells Bros. & Co.**, Greenfield, Mass.  
**Wiley & Russell Mfg. Co.**, Greenfield, Mass.
- Screw Drivers.**  
**Brown, R. H. & Co.**, New Haven, Conn.  
**Gay & Parsons**, Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**  
**Jarecki Mfg. Co.**, Erie, Pa.
- Screws, Makers of.**  
**American Screw Co.**, Providence, R. I.  
**Blake & Johnson**, Waterbury, Conn.  
**Wm. H. Haskell Co.**, Pawtucket.  
**Miles, F. S.**, 205 Quarry, Philadelphia.  
**New England Screw Co.**, Boston, Mass.  
**Reynolds & Co.**, New Haven, Conn.  
**Worcester Machine Screw Co.**, Worcester, Mass.
- Scroll Saws.**  
**Barnes, W. F. & John**, Rockford, Ill.  
**Seneca Falls Mfg. Co.**, Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**  
**Pike Mfg. Co.**, Pike Sta'n, N. H.  
**Cleveland Stone Co.**, Cleveland, O.
- Sewing Machines.**  
**Household Sewing Machine Co.**, Chicago, Ill.
- Shaft Coupling.**  
**Columbian Novelty Co.**, North East, Penna.
- Shafting, Makers of.**  
**Brown, A. & F.**, 17 Day St., N. Y.  
**Cresson, Geo. V. Co.**, Philadelphia, Pa.  
**Fairmount Mch. Co.**, Philadelphia, Pa.  
**Sellers, Wm. & Co., Inc.**, Phila., Pa.  
**Stow Mfg. Co.**, Binghamton, N. Y.
- Shaft Support.**  
**Decatur Shaft Support Co.**, Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**  
**Esna-Standard Iron & Steel Co.**, Bridgeport, O.  
**East Chicago Fdy. Co.**, Chicago, Ill.



- Allentown Rolling Mill, Allentown, Pa.**  
Lockhart Iron & Steel Co., Pittsburgh, Pa.
- Passaic Rolling Mill Co., Paterson, N.J.**  
Pottsville Iron & Steel Co., Pottsville, Pa.
- Roberts, A. & P. & Co., Phila. Pa.**  
The Phoenix Iron Co., Phila., Pa.
- Shears and Scissors.**  
Aome Shear Co., Bridgeport, Conn.  
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**  
Etna-Standard Iron and Steel Co., Bridgeport, O.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Jersey City Galvanizing Co., 112 John St., N. Y.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Morehead-McCleane Co., Pittsburgh, Pa.  
Pierson & Co., 29 Broadway, N. Y.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Show Cases.**  
Union Show Case Co., Chicago, Ill.
- Sinks.**  
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**  
Keene Mfg. Co., Keene, N. H.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**  
Henley, M. C., Richmond, Ind.  
Union Hardware Co., Torrington, Ct.  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Slag Machines.**  
Cambria Iron Co., Johnstown, Pa.
- Smelting Works.**  
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**  
Clendenin Bros., Baltimore, Md.  
Covert Mfg. Co., West Troy, N. Y.
- Soldering Furnaces.**  
Burgess Soldering Furnace Co., Columbus, Ohio.
- Speaking Tubes.**  
Ostrander, W. R. & Co., 204 Fulton St. N. Y.  
Wollensak, J. F., Chicago, Ill.
- Spelter.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.  
Missouri Metal Co., St. Louis, Mo.
- Spoons and Forks.**  
Boardman, L. & Son, New Haddam, Conn.  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**  
Hartley & Graham, 313-315 B'way, N.Y.
- Spring.**  
Clark & Cowles, Plainville, Ct.  
Coiled Wire Belting Co., Jersey City, N. J.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.  
Roland, Wm. & Harvey, Phila., Pa.  
Sabin Machine Co., Montpelier, Vt.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**  
Bommer Bros., Brooklyn, N. Y.  
Chicago Spring Butts Co., Chicago, Ill.  
Pulman Sash Balance Co., Rochester, N. Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.
- Stamping Works.**  
Avery Stamping Co., Cleveland, O.  
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**  
Cobb & Drew, Plymouth, Mass.  
Titchener, E.H. & Co., Binghamton, N.Y.
- Steam Gauges.**  
Bristol Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**  
Dienelt & Eisenhardt, Philadelphia.  
Dudgdon, Richard, 24 Columbia Street, N. Y.  
Tretlow Mfg. Co., Pittsburgh, Pa.
- Steam Heating & Oil Separators.**  
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Wks., Phila., Pa.  
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**  
Lunkenheimer Co., Cincinnati, O.
- Steel, Cold Rolled Strip.**  
Superior Steel Co., Pittsburgh, Pa.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.**  
Krogerud, W., 61 Fulton St., N. Y.
- Steel Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.  
Miller, A. & Co., 1 Broadway, N. Y.  
Newton & Shipman, 83 John, N. Y.  
Wetherell Bros., 93 Liberty St., N. Y.  
Whitney, A. R. & Co., B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**  
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**  
Etna-Standard Iron & Steel Co., Bridgeport, O.  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Baker, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N. Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.  
Kaiser, Ellison & Co., Sheffield, Eng.  
La Belle Steel Co., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Moorehead-McCleane Co., Pittsburgh, Pa.  
Moss, F. W., 83 John, N. Y.  
Pottsville Iron and Steel Co., Pottsville, Pa.  
Bowland, Wm. & Harvey, Frankford, Philadelphia.  
Singer, Nimick & Co., Pittsburgh, Pa.  
Superior Steel Co., Pittsburgh, Pa.  
Valley Steel Co., St. Louis, Mo.  
Wordlaw, S. & C., Sheffield, Eng.  
Wetherell Bros., 93 Liberty St., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**  
Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.**  
Bicycle Step Ladder Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Croissant, M., Albany, N. Y.  
Morley Bros., Saginaw, Mich.
- Stocks and Dies.**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Oster Mfg. Co., Cleveland, O.  
Saunders' Sons, D., Yonkers, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**  
Lincoln Iron Works, Rutland, Vt.
- Stone Linings.**  
Ostrander Fire Brick Co., Troy, N. Y.
- Stone Pipe Thimbles.**  
Cheney, S. & Son, Manlius, N. Y.
- Stone Trucks.**  
Gwinner Mfg. Co., Hamilton, Ohio.
- Stoves, Gasoline.**  
Standard Lighting Co., Cleveland, O.
- Street Lamps.**  
Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Structural Iron Work.**  
Berlin Iron Bridge Co., East Berlin, Conn.  
Lindsay, Jas. G. & Co., Phila., Pa.
- Sulphuric Acid.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**  
Atlas Tack Corporation, Boston, Mass.  
Chess Bros., Pittsburgh, Pa.  
Clendenin Bros., Baltimore, Md.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**  
Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.  
Manning, Maxwell & Moore, 111 Liberty St., N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**  
Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.**  
Riehle Bros. Testing Mach. Co., Phila.
- Theatrical Hardware.**  
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**  
Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.
- Thrust Collars.**  
Gouverneur Mach. Co., Gouverneur, N. Y.
- Timber and Mineral Lands.**  
Robertson, E. Co., Cincinnati, O.
- Time Record.**  
Scattergood, H. W., Phila., Pa.
- Tin Plate Machinery.**  
Lloyd Booth Co., Youngstown, Ohio.
- Tire Upsetters.**  
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**  
Burke, P. F., Boston, Mass.
- Tool Blocks.**  
Hubert-Rogers Mch. Co., South Sudbury, Mass.
- Tool Chests.**  
Am. Tool Co., 200 W. Houston St., N.Y.
- Tool Holders.**  
Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.**  
Britton, Horace E., Stoughton, Mass.  
Brown, R. H. & Co., New Haven, Conn.  
Fray, Jno. S. & Co., Bridgeport, Conn.  
Hoggson & Pettis Mfg. Co., New Haven, Conn.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 93 Reade, N. Y.  
Richardson, C. F. & Son, Athol, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, Staret, L. S., Athol, Mass.  
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.  
Tower & Lyon, 95 Chambers St., N. Y.  
Wilkinson, A. J. & Co., Boston, Mass.
- Tools, Blacksmith and Wheelwright.**  
Buffalo Forge Co., Buffalo, N. Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Plumb, Fayette R., Philadelphia, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**  
Saunders' Sons, D., Yonkers, N. Y.
- Tools, Tanners'.**  
Peerless Cooke Co., Buffalo, N. Y.
- Torches, Oil and Gasoline.**  
Dangler Stove & Mfg. Co., Cleveland, O.  
Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**  
Wollensak, J. F., Chicago, Ill.
- Trucks, Manufacturers of.**  
Clark, G. P., Windsor Locks, Conn.
- Tubes, Seamless Drawn Copper.**  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Randolph & Clowes, Waterbury, Conn.
- Tube, Steel.**  
Avery Stamping Co., Cleveland, O.  
Leng's, John S. Son & Co., 4 Fletcher St., New York.  
Shelby Steel Tube Co., Shelby, Ohio.  
U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**  
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**  
Central Iron & Steel Co., Brazil, Ind.  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**  
Cleveland Twist Drill Co., Cleveland.  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**  
Chapman Valve Mfg. Co., Boston.  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jerkins Bros., 71 John, N. Y.  
Lunkenheimer Co., Cincinnati, O.  
McNab & Harlin Mfg. Co., 56 John, N. Y.
- Ventilating Fann.**  
Huyett & Smith Mfg. Co., Detroit, Mich.
- Ventilator Appliances.**  
Howard & Morse, 10 Fulton St., N. Y.
- Vise Jaws.**  
Newark Mch. Tool Co., Newark, N. J.
- Vises.**  
Hollands Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N. Y.  
Millers Falls Co., 93 Reade St., N. Y.  
Prentiss Vise Co., 44 Barclay, N. Y.  
Tower & Lyon, 95 Chambers St., N. Y.
- Wagon Jacks.**  
Covert Mfg. Co., West Troy, N. Y.  
Covert's Saddlery Works, Farmer, N.Y.
- Wagon Poles.**  
Hartzell, Geo. W., Greenville, Ohio.
- Washboards.**  
Olds Wagon Wks., Ft. Wayne, Ind.
- Washers.**  
Haskell, Wm. H. Co., Pawtucket, R. I.  
Milton Mfg. Co., Milton, Pa.  
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**  
Diether & Barrows, Ft. Wayne, Ind.  
Olds Wagon Works, Ft. Wayne, Ind.  
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.
- Watches.**  
Ingersoll, R. H. & Bro., 85 Cortlandt St., N. Y.
- Water Meters.**  
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**  
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**  
Amer. Steel Scraper Co., Sidney, Ohio.  
Bryan Mfg. Co., Bryan, Ohio.  
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.  
Sidney Steel Scraper Co., Sidney, O.  
Toledo Wheelbarrow Wks., Toledo, O.
- Wheels.**  
Arnold Metal Wheel Co., New London, Ohio.
- Window Cleaners.**  
Bourke Mfg. Co., Youngstown, O.
- Window Cord, Makers of.**  
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**  
American Wire Co., Cleveland, Ohio.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Salem Wire Nail Co., Salem, O.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester.  
Wetherell Bros., 93 Liberty St., N. Y.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Esbey, W. S., 65 Fulton, N. Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Morse, 45 Fulton, N. Y.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
N. J. Wire Cloth Co., Trenton, N. J.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**  
Higganum Hdw. Co., Higganum, Conn.  
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**  
McFarland, Wm., Trenton, N. J.  
Newton & Shipman, 83 John St., N. Y.
- Wire Fences, See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**  
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Darby, Edward & Sons, Phila.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
Ludlow-Saylor Wire Co., St. Louis.  
Ossawa Mills Co., Norwich, Conn.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Williamson, C. T., Wire Novelty Co., Newark, N. J.  
Wire Goods Co., Worcester, Mass.
- Wire Machinery.**  
Am. Tool Wks., Cleveland, O.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Morgan Construction Co., Worcester, Mass.  
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Cutting Machinery.**  
Add, John & Son, New Haven Conn.
- Wire Nails.**  
Bond Nail Co., Raynham, Mass.  
Indiana Wire Fence Co., Crawfordville, Ind.  
Kilmer Mfg. Co., Newburg, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Phillips, Townsend & Co., Phila., Pa.  
Salem Wire Nail Co., Salem, O.  
Taunton Wire Nail Co., Taunton, Mass.  
Whitney, A. R. & Co., New York City.
- Wire Rods, Steel.**  
American Wire Co., Cleveland, Ohio.  
New Castle Wire Nail Co., New Castle, Pa.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.**  
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California Wire Works, San Francisco.  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Leschen & Sons Rope Co., St. Louis.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester, Mass.
- Wire Rope Machinery.**  
Ray, J. F., Passaic, N. J.
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- Wood-Working Machinery.**  
Fay, J. A. & Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.  
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Bemis & Call Hardware & Tool Co., Springfield, Mass.  
Billings, Spencer & Co., Hartford, Conn.  
Coos Wrench Co., Worcester, Mass.  
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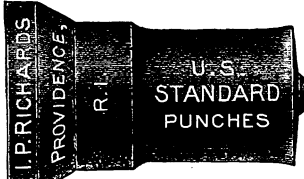
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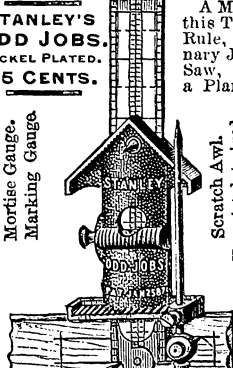
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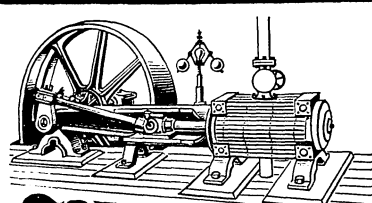
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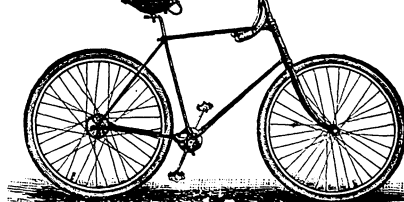
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**See Page 64.**

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# THE IRON AGE

THURSDAY JULY 5, 1894.

## Increasing the Life of Furnace Linings.

James Gayley of Braddock, Pa., has contributed the following remarks to the discussion of E. C. Potter's paper, on "American Blast Furnace Practice," read at the international meeting of the American Institute of Mining Engineers, at Chicago, last year:

Mr. Potter has made reference to our practice at the Edgar Thomson Works in the direction of increasing the life of the lining, and mentions the product of one of our furnaces as having reached a total of 370,000 tons. It may be interesting to know that this furnace has been put out of blast with a record of 452,685 tons, after a run of three years and nine months. A companion furnace to this will produce before the present year is ended 500,000 tons. As Mr. Potter has quite correctly designated this as "the newest problem in furnace practice," a description of the construction of this furnace lining may be welcome to members. The bricks used in the lining are 9 and 13½ inches long, with the requisite quantity of straight and key shapes to turn the circle. These bricks are well suited for inclosing the numerous bosh plates used for cooling. The bosh plates (the efficient fortress of the lining) extend from the top of the tuyere arch to the mantel, and are inserted in rows, 18 inches to 2 feet apart. These form a perfect defense against encroachment on the bosh lining, and leave the bosh at the end of the blast of the same thickness as at the beginning. The protection afforded by these bosh plates is the principal cause of the increased duration of the furnace lining. But it must be noted that the shape and material of the plate are essential elements. The most serviceable plate is that made of bronze or copper. We have tried every form of iron plates without obtaining satisfactory results. These were replaced with bronze plates, built into the lining, which gave excellent results so long as they did not leak; but when this occurred, as it did in time, the water was shut off, and, since the plates could only be removed with difficulty, they were allowed to burn off. This permitted encroachment on the bosh walls, which thus became enlarged beyond the limit required for econom-

ical practice. With the introduction of the removable plate, made tapering on the sides, with plain surfaced top and bottom, these troubles have been overcome. A plate can be easily removed when a leak occurs and a new one can be inserted in less than half an hour. By this means the bosh wall is preserved in shape throughout the whole blast and economy of practice is maintained.

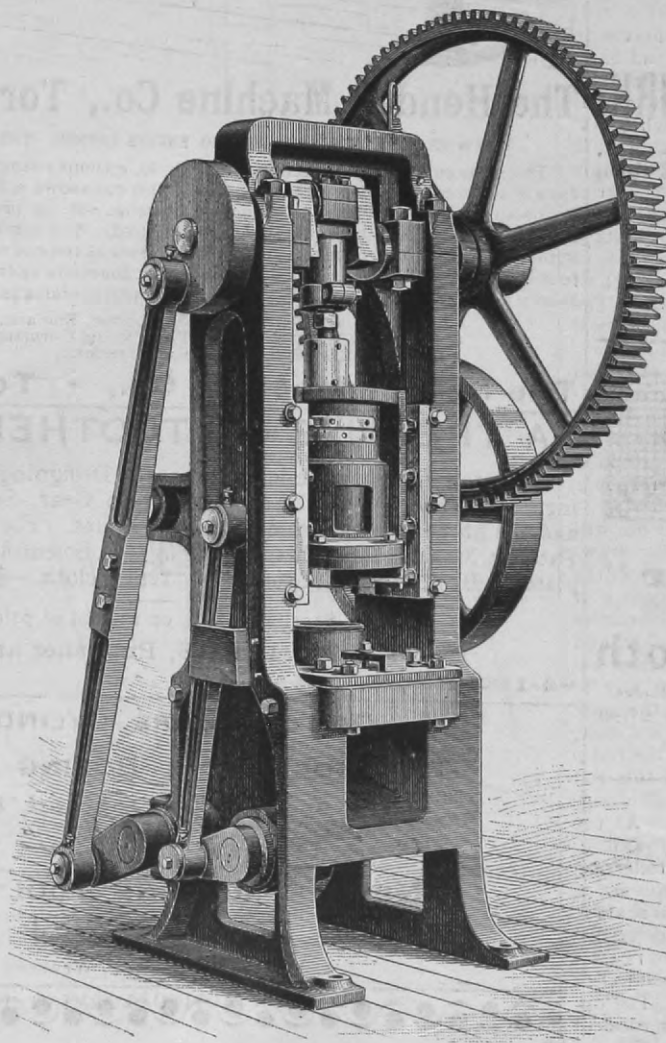
One point, particularly worthy of mention, has been observed recently, viz., that the removable bosh plate (of

furnace practice during the past 12 years; yet great as it has been, I venture to predict that the next 12 will show as long a stride beyond our present achievements.

## Double Acting Forming Press.

By referring to the accompanying illustrations it will be seen that this press—which has been lately placed on the market by the Waterbury Farrel

Foundry & Machine Company of Waterbury, Conn., has no more complication of parts overhead than the ordinary drawing presses. The space below the die has been used to inclose a toggle combination, still leaving the necessary amount of room for drawing work through the bed. The gate is well guided and has large bearing surfaces carefully fitted and properly gibbed so that it may be adjusted easily. The vertical adjustment of the blank holder is accomplished by means of a single large screw and nut with check. For work up to the capacity of the press given below the single straight adjustment of the dies is sufficient, but for some grades of work the blank holder is made adjustable by independent screws at two or more points. Special attention is called to the simplicity of the gate actuating mechanism, wherein, by a crank plate and connection to the rocking shaft at the back, a secondary rocker is operated under the center of the bed, having crank arms at each end, which through outside links give motion to the gate or blank holder. By this means all distortion due to the application of power to the toggle mechanism at one side of the machine is ob-



DOUBLE ACTING FORMING PRESS.

bronze or copper) protects not only the bosh wall, but also the whole of the upper lining, from the point where the stock strikes against the top lining down to the mantel. The wear of the lining, for double the production, is only about half what it was when the bosh was protected differently. The result, as amply demonstrated by practice, is that the fuel consumption does not increase with the length of the blast, as has been the usual experience; and it also follows that the production maintains its regularity.

Mr. Potter has ably summarized the great progress made in American blast

viated. The machine is geared about eight to one, has a fly wheel 36 inches in diameter by 4½ inches face, and is provided with an improved form of clutch. The press will cut and hold a 10-inch blank and will draw a 6 inch shell. The cutting stroke is 4½ inches and the drawing stroke 9 inches. The height from the floor to the bed is 30 inches, from the floor to the shaft, 76 inches, and the total height 8 feet 8 inches. The distance between the bed and gate when the gate is down is 11 to 13 inches. The bed measures 25 inches from front to back and 19 inches between the uprights; the hole in the bed

is 8 inches in diameter. The floor space required is  $4\frac{1}{2} \times 5$  feet. The machine weighs 8000 pounds.

The principal features of the press will be understood from the drawings, Figs. 2 and 3, the former being a vertical section showing the forming die and blank holder at their highest position, the downward movement being about to commence. The other drawing is a similar view, the downward movement of the forming die and blank holder having proceeded until the latter is approximately in operative position and the forming die is about to act. The frame work of the press is shown at *a*, *b* being the table and *c* the lower die. Mounted on the power shaft *d* is a pinion engaging with a gear (shown in the perspective view) on a shaft near the top of the frame. At the middle of this shaft is a crank, *e*, provided with the crank rod *f* and the carrier *g* for the upper die *h*, which is connected with the crank rod by a ball and socket joint. The gate *i* moves in ways formed in the frame and is retained in place by guides. The draw bar lies in a recess in the gate and is formed with a threaded hub, which extends upward through an opening, *n*, in the gate. This hub is provided with a central opening in which the carrier moves freely. The draw bar is adjustably secured to the gate by nuts *j*. The purpose of this adjustment is to regulate the closeness of approach of the blank holder to the lower die. The plate *k* is secured to the gate by screws, and in order to make this plate perfectly rigid with the gate it is provided with a rib which engages a corresponding groove in the gate. The blank holder *m* is secured to the gate by bolts, as shown. The lower die is provided with a hub which engages a corresponding opening in the table.

The operation of the upper die will be clearly understood from the drawings. The carrier *g* slides freely in the threaded hub, wholly independently of the movements of the gate, the carrier receiving motion from the crank *e*, and the gate carrying the blank holder receiving motion in the manner now to be described. At the end of the main shaft opposite the gear wheel is a disk, *o*, to the crank pin of which the rod *p* is pivoted. The other end of this rod is connected to a crank on a shaft designated the primary rock shaft. At the middle of this shaft is a toggle arm, *q*, which is slotted to receive a roller entering the closed slot of the toggle arm *s*, mounted on the secondary rock shaft *r*. On the ends of this shaft are cranks (shown in the perspective view) carrying the links *t*, whose opposite ends are attached to the draw bar. The operation is as follows: Each rotation of the main shaft causes an upward and a downward movement of the upper die and also of the blank holder, the upper die being operated by means of the central crank on the main shaft and the blank holder being operated by the toggle arms. The crank *e* and the crank pin on the disk *o* are nearly opposite each other, as shown in Fig. 3. When the crank pin is raised the crank rod *p* is drawn upward, thereby swinging the toggle arm *q* downward. This swings the toggle arm *s* downward and operates the draw bar through the rods *t*. The action of the upper die is caused by the simultaneous downward movement of crank *e*. It is evident that the parts are so timed that the blank holder will reach its operative position and will hold the blank firmly before the upper die begins to act, and that it will continue to hold the blank until after the upper die has ceased to act.

### The 24-Hour Average Basis for Settling Demurrage.

Among the contributions brought before the fifth annual meeting of the National Association of Car Service Managers, at Old Point Comfort, was one by A. M. Simmons of Cleveland on the 24-hour average system. This provides that if a consignee unloading say 1000 cars a month detains them on an average only 24 hours each he pays nothing, even though individual cars may have been detained beyond the free time limit. The total detention of his

ent sections of the country demanded different regulations. Forty-eight hours' free time might be agreed upon as right in one district, while others would demand 72 hours, 96 hours, or more. Rules applicable to interior districts could not be agreed upon for seaports. Consequently many exceptions and extensions were made to the simple 48-hour rule recommended by the American Railway Association.

The different rules now in force may be summarized as follows: Freight to and from lake ports is held free in cars indefinitely by all associations. Freight for export is by some associations held

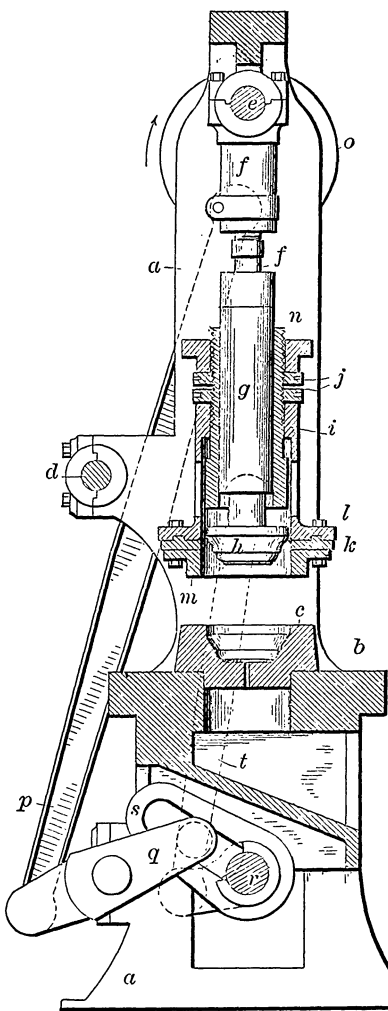


Fig. 2.—Central Vertical Section.—Die in Highest Position.

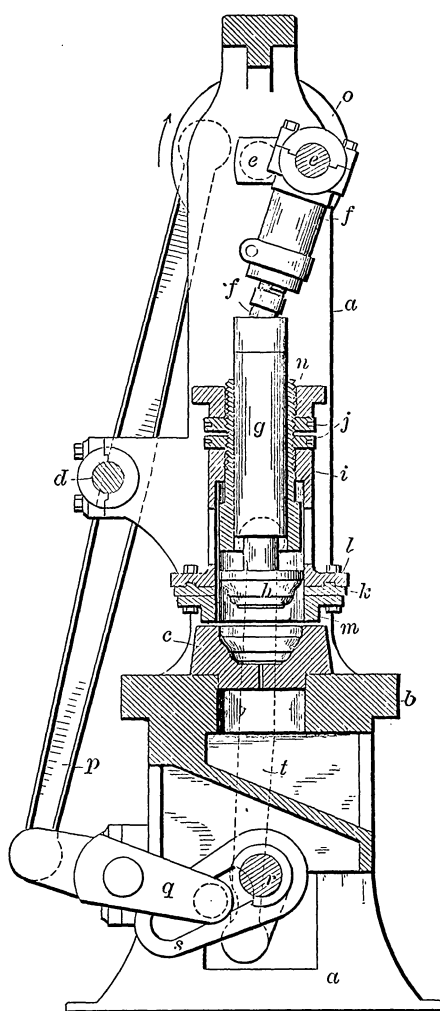


Fig. 3.—Central Vertical Section.—Die in Operative Position.

### DOUBLE ACTING FORMING PRESS.

cars is computed, 24,000 hours (free time on 1000 cars) is deducted, and he pays on the balance at \$1 for each 24 hours. The *Railroad Gazette* prints the following from Mr. Simmons' paper:

At the time car service associations were established, there existed throughout the country a general disposition on the part of the public to make free storehouses of freight cars, and when an agent requested prompt discharge of lading he was considered impertinent. Car famines were of frequent occurrence, and in the worst of these it was not uncommon for large concerns to actually suffer for means of transportation, while they were themselves holding large numbers of cars. . . . While the value of a freight car as a vehicle was about the same at one competing point as another, there were different conditions in different districts, so that differ-

ent sections of the country demanded different regulations. Forty-eight hours' free time might be agreed upon as right in one district, while others would demand 72 hours, 96 hours, or more. Rules applicable to interior districts could not be agreed upon for seaports. Consequently many exceptions and extensions were made to the simple 48-hour rule recommended by the American Railway Association.

The tendency to deviate from the 48-hour rule has been observed in the operation of nearly every car service association. The reduction in consignees' detention, even under the



varied rules now in effect, has been very satisfactory; but, in order to have permanency and efficiency, the rules should be uniform. They should not be arbitrary, but to a large extent depend upon the co-operation of the public. It seems, therefore, our duty to agree as speedily as possible on a uniform code for the government of all.

Early in the history of our association, efforts to collect detention charges from large concerns, who handled hundreds of cars monthly, were not rewarded with a very great degree of success. We were met with the argument that credit in time for prompt release of cars ought to be given as against the few cars which were unavoidably held over 48 hours. It was claimed by these concerns that as soon as a train of cars were placed 100 men or more, if necessary, were transferred from other work to unload them, and the whole train would often be released within an hour. It was pointed out to us also that detention charges rarely accrued, except when cars were bunched *en route*, or delivered out of the order of arrival, and that no charges accrued on empty cars placed for loading. In brief, they claimed that they transacted their business with the railroad companies by wholesale methods, and should not, in justice, be governed by the general rule applicable to consignees handling only a few cars. Our explanation that after payment of car service charges, our manner of treating claims was by refund voucher, where cars were bunched or placed out of the order of arrival or on account of unavoidable circumstances, was viewed by these institutions as inconsistent with good business methods.

The great problem was how to reach these consignees. Litigation as a means of settling differences, especially between the railroads and their patrons, was to be deprecated, and only resorted to when all other measures had failed. The oft repeated declaration that car service associations were not established for the purpose of revenue, but for the prevention of abuses, could not be lost sight of. In fact, we were often reminded of it by these people. The mere publication of car service rules had caused many of our patrons to build large additions to their warehouses, and they were loading and unloading cars with a view of preventing detention charges.

The Philadelphia Association early in 1891 put into effect a 24-hour average rule, adjustments being made monthly. After one year's trial the association was greatly pleased with it, and the Cleveland Car Service Association adopted it on September 1, 1892. . . . After a practical test of over three years by the Philadelphia Association, almost two years by the Baltimore and Washington Association, several months by the Northeastern Pennsylvania Association, one year by the Central New York Association, and our own experience for nearly two years, we are convinced that the application of the 24-hour average rule is more in harmony with the diverse commercial interests of the country, than any other now enforced, and, taken together with the 48-hour rule, is the solution of the car service problem, so far as relates to consignees' detention. Among its advantages are the following: 1. This rule can be uniformly applied to all commodities by all car service associations throughout the country. 2. By this method we gain for the cause of car service associations that all important feature—co-operation of consignees with the manager in his

efforts to reduce detention. 3. It eliminates all friction between the railroads and the public incident to the enforcement of car service regulations. 4. It secures a written contract to conform to its requirements, besides a guarantee against unnecessary or careless detention. 5. No questions arise on account of bunching, and the railroads are relieved of the extra expense of placing cars in the order of arrival. 6. Consignees and shippers are credited for prompt loading and unloading, and are charged for their neglect to do so. 7. Concerns working under this rule load and unload cars with more system and greater dispatch than under a 48 or 96 hour rule, because it is to their interest to do so; besides, they believe in its fairness, and their co-operation with the association is freely secured. 8. The application of this rule relieves station agents from appearing before their patrons in the very unpleasant attitude of collectors of car service charges and solicitors of freight, which embarrassing position has caused many good agents to defer the collection of car service charges.

This rule does not discriminate between shippers, as its provisions are offered to all, and if even the smallest shipper working under it can release his cars on an average of 24 hours, we are pleased to refund on a few cars held over time. Small shippers, however, very generally prefer the 48-hour rule. The good business man will often load and unload whole trains of cars in an hour's time in order to secure credit, but under the 48-hour rule he is not induced to any quicker action than is absolutely necessary to unload within the free time allowed.

Every business concern realizes that in the course of a month storage charges will accrue, in spite of the best efforts to prevent it. The incentive of the 24-hour average rule is to unload whole trains quickly and thus secure credit against such charges.

### Our National Defenses.

The presidential address of Col. W. P. Craighill, United States Army, before the American Society of Civil Engineers, at their Niagara Falls convention, dealt with our national defenses.

Some erroneous ideas have prevailed, and still prevail, among many of our people. When the Civil War came on our sea coast defenses were admitted to be as good as any in the world. In one great particular they were better than those of any other people—that was the Totten embrasure. In a casemated battery built for the defense of a great European port just before the introduction of the Totten embrasure here, the opening in the wall of the embrasure was 54 square feet, and the horizontal traverse of the gun was only 40°. The Totten embrasure gave an opening of only 9 square feet, and gave a horizontal traverse of 60°. The wall around the throat of this embrasure was strengthened by wrought iron, 1 foot thick, inserted in the masonry, and lead concrete was also used as a most excellent material for resisting the impact of shot. Wrought iron shutters were added, which closed automatically, were thick enough to exclude grape shot, and kept out the smoke of the discharge. This invention of General Totten, who was then Chief of Engineers of the army, is of historic interest as the first instance of the use of iron plating on land batteries. Some of these old forts are still

of value, but not to be entirely depended upon for the defense of our harbors.

A very important part of our present system of defense consists of torpedoes, but these must be under the fire of guns on land, in order that the enemy cannot remove or disable them. The light craft which would be used by a fleet for this purpose would be vulnerable to the fire of such guns as will still be accommodated in the Totten embrasure. Great iron clads must be met by the heaviest guns and mortars, mounted behind impenetrable, covered masses, and made as safe as possible by all the modern improvements, but it would be a waste of energy and money to fight the smaller craft with these largest guns.

Some historical incidents were introduced to show the value of small guns, to be used at comparatively short range, and to show the defensive power of forts of even moderate strength. The attack of the British on Baltimore in 1812, and the experiences of Fort Sumter during our war, were introduced for this purpose. Invulnerability is not to be aimed at in constructing land defenses, but relative vulnerability and endurance, and here the advantage will always be on the side of the defense; and guns of a given power can be mounted cheaper on land than on water, and will have the advantage in stability and accuracy of fire.

No armor has yet been produced that can properly be called invulnerable, and it is safe to say that none such ever will be produced; and, unless the decks of ships are as heavily plated as their sides, they will be penetrable by shells from rifled mortars, the accuracy of which has recently been greatly improved.

It is often said, and especially by people in the interior, who themselves are not directly subject to attack, that no enemy would undertake to land an army on our shores, as our militia would rise and drive the invaders into the ocean. It is true that our people are brave, and, under discipline and with experience, make as good soldiers as any in the world, but in attempting to prevent a descent upon the coast they could make no prolonged resistance to the big guns of an invading fleet. The more the men who lined the shores, even with the best rifles and field artillery, the greater would be the slaughter. Some fixed defenses must be provided for our great cities and harbors. Reliance upon torpedoes alone is mistaken, for torpedoes may be taken up as easily as they can be put down, unless they are placed under fire from the shore—that is, they are only an adjunct to defense. Neither is it the best economy to mount our guns for harbor defense solely upon ships. This would require at every point to be defended a fleet as strong as the enemy could be expected to bring against it, and the first cost of mounting guns ashore is far less than putting them on ships, and the life of shore fortifications is longer than the life of ships. It would take a navy greater than that of all the other nations of the world combined to defend the immense coast line of the United States.

In 1816 the Board of Engineers laid down the following principles for the defense of our coast:

1. They must close all important harbors against an enemy, and secure them to our military and commercial marine.

2. They must deprive an enemy of all strong positions, where, protected by naval superiority, he might fix permanent quarters in our territory, main-

tain himself during the war, and keep the whole frontier in perpetual alarm.

3. They must cover the great cities from attack.

4. They must prevent, as far as practicable, the great avenues of interior navigation from being blockaded at their entrance into the ocean.

5. They must cover the coastwise and interior navigation, by closing the harbors and the several inlets from the sea which intersect the lines of communication, and thereby further aid the navy in protecting the navigation of the country.

6. They must protect the great naval establishments.

These principles are fundamental, and have stood the test of argument and experience, but the means of carrying the principles out have changed, and now it is necessary to concentrate at the points to be defended armaments equal in weight and metal to those of any possible attacking fleet, supplemented by torpedo defense.

Another important element in our defensive system is the ship canal, and an interior line of waterway parallel to the Atlantic and Gulf coasts is of great importance. It would be useful in peace, and in time of war its advantage to our naval and merchant marine would be incalculable. For instance, a ship canal connecting the great bays of the Chesapeake and the Delaware would enable a single fleet to be prepared to promptly meet an enemy threatening either of these waters. A great canal should connect the lakes with the Mississippi, and the Erie Canal should be made wider and deeper; but most important of all is a canal across the Isthmus, between the Atlantic and Pacific Coasts. The immense commercial and military advantages to be gained from the building of such a canal should be controlled by the United States, and it is certain that the Nicaragua Canal will be opened before many years have passed, if not by the United States by England or by Germany.

#### A Chicago Electric Elevated Railroad.

The use of electricity as the motive power on the Metropolitan Elevated Railroad in Chicago is now assured. The contract for the necessary equipment was placed on June 22, and is said to be the most important electrical contract that has been closed in the United States for a year. The officers of the company have been making extensive investigations for some time into the relative cost of running their trains by steam and electricity. At first they decided in favor of steam and made partial contracts for locomotives, but afterward were so strongly impressed by the claims made for electricity that they canceled the contracts and pursued their investigations further. They are now satisfied that they can effect a net saving of about \$200,000 a year by using electricity. The economy is secured by the use of cheaper fuel in the power house than is permissible under the boilers of the steam locomotives and by the lessening of the labor bill, due to the fact that no high priced enginemen and firemen are needed on the trains. With this in view and with the object lesson afforded by the Intramural Elevated Electric Railroad in operation at Jackson Park last summer, the directors of the Metropolitan Company came to the conclusion to employ electrically transmitted power.

Bids for all or a portion of the elec-

trical equipment were furnished by the General Electric Company, Schenectady, N. Y.; Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.; Siemens & Halske Electric Company of America, Chicago; Walker Mfg. Company, Cleveland, Ohio, and Electric Construction Company, London. Owing to the tariff on electrical machinery, the English company's bid was much higher than that of any American bidder. After due consideration the contract for the entire electrical equipment was awarded to the General Electric Company. The contract price is supposed to be in the neighborhood of \$200,000 or \$225,000. The contract covers the generators, switchboard, motors, line and construction work. Four generators are to be provided—two of 1500 kilowatts each

remain to be settled. The apparatus will all be of the standard railway type of the General Electric Company.

The management of the road is anxious to run trains early in the fall, and it is not unlikely that some temporary arrangement for obtaining power may be made if the generators are not ready for operation by that time. The Metropolitan Elevated Railroad will be the first permanent all elevated road in the United States to be operated by electrically transmitted power. The main line is about 5 miles long, running due west between Van Buren and Congress streets, with a northern branch at Paulina street. The structure and stations are nearly completed.

The Northwestern Elevated Railroad, which is to be built on the north side

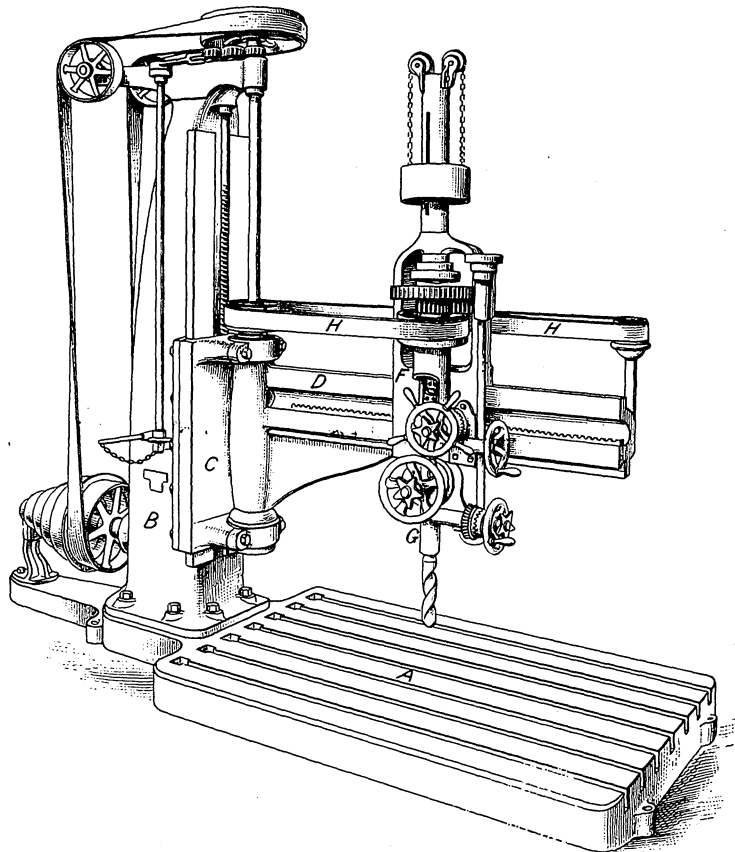


Fig. 1.—Simple Arm.

#### THE BAUSH DRILLING MACHINE.

to be operated at 75 revolutions per minute, and two 800 kilowatt machines designed for 100 revolutions. Thus the total initial capacity of the station will be 4600 kilowatts, or over 6000 horsepower. The generators will all be directly coupled to the engines, but the type and make of the latter have not yet been announced.

At the start the road will be operated on a plan calling for 55 three-car trains and consequently demanding the same number of motor cars. Each motor car will be supplied with two 100 horsepower motors—one on each truck—and 110 motors will, therefore, be necessary. Series parallel controllers, improved somewhat over the type in use on the Intramural road, will be used, and the current will be transmitted to the motors by a third rail at 500 volts pressure. In general, the system of operation in use at the World's Fair will be adopted, but many details, such as the position of the motorman, and the question of open and closed cars,

of the city, will also be operated by electricity. The promoters of the scheme announced that as their intention from the inception of the project. But the Metropolitan, with its structure nearly completed, will be the first in the field to operate without the use of steam motors.

#### The Baush Drilling Machines.

The principal characteristic of a drill which is made by C. H. Baush & Sons of Holyoke, Mass., is found in the provision for swinging the arm easily. Although the engravings show a simple and a jointed arm, the construction permitting the easy swinging of this arm is practically the same in both cases, even in drills of large size. Referring first to Fig. 1, A represents the bed of the machine, B the post or column, and C the support, which is vertically movable on the post as operated by the screw. The arm D is pivotally mounted for its

horizontal swinging movement on the arm support C. The carriage F is mounted for its feed movement longitudinally of the arm, the drill spindle G being rotatably and vertically mounted in the carriage. The arm support C has upper and lower brackets or arms having bearings to receive hubs formed on the top and bottom of the inner extremity of the arm D. At the base of the upper boss is a ledge upon which rest the lower ends of a series of vertically placed rollers. A like series of rollers fills the annular space between the lower boss and the bracket socket. A ball bearing at the base supports the arm D, a hardened steel ring being interposed between the tops of the balls and the bottom of the lower boss. Provision is made for taking up wear. It is stated that in a 14-ton drill constructed in this manner with a ball support and roller bearings,

be rotated about a horizontal axis at right angles to the length of the front arm. The head G is so connected with the outer end of the arm D that it may be swung at any required angle. The method of driving the spindle through the belts and spur and beveled gears is clearly shown in the drawing.

The steam shovels for excavating the great Chicago drainage canal have been furnished largely by the Bucyrus Steam Shovel & Dredge Company of South Milwaukee, Wis. They now have 14 shovels of their make engaged in this work and are constructing five more for the same purpose, which will be ready within a few weeks. Four of the new shovels have been ordered by the contracting firm of Griffiths & McDermott and will be, it is claimed, the largest and most powerful machines of the kind ever built. Each will weigh

### Benjamin Huntsman of Sheffield, the Inventor of Crucible Steel.\*

BY R. A. HADFIELD, SHEFFIELD, ENGLAND.

It was in the immediate neighborhood of Sheffield that the first successful process for the fusion of steel on a commercial scale saw the light. The late Dr. Percy, a leading authority in general metallurgy, says:

"Formerly, so far as I am aware, steel was never melted and cast after its production; and in only one instance—viz., that of Woolz steel—was it ever molten during its production. Indeed, by the founding and casting of steel after its production its heterogeneousness is remedied, and ingots of the metal can be produced of perfectly uniform composition throughout, and for the practical solution of this important problem we are indebted to Benjamin Huntsman of Sheffield."

As a recent American journal appropriately remarks:

"Huntsman's patient efforts, at last rewarded with success, entitle him to an elevated niche among the heroes of industry. The invention of cast steel was second in importance to no previous event in the world's history, unless it may have been the invention of printing."

This citizen of Sheffield was born in 1704, his parents being natives of Holland, who came over and settled in England. He belonged to that sturdy religious persuasion, the Quaker body, which has done much for Great Britain, as it has for a large State in America interested in the iron and steel manufacture. His character is shown by the fact that he would not allow any portrait to be taken of himself, and he refused an offer to be made a member of the Royal Society in 1750, when his fame had already begun to spread.

The writer has had the pleasure of knowing both the great-grandson (recently deceased) of Benjamin Huntsman and also the present head of the business and fourth lineal descendant, Frank Huntsman. The latter successfully carries on the manufacture of the highest qualities of Huntsman's cast steel, the name of which still stands in the first rank for quality, a striking example of continuous success in a business which is founded on the production of an article of the highest and best character. Not many of us can go back four generations to the origin of our business.

As some readers of this paper may not be aware why the first production of steel alloys occurred in the neighborhood of Sheffield, a brief account of this region and of Huntsman's early work may be of interest.

For several centuries Sheffield has been famous for its hardware productions, particularly in articles made of steel. Chaucer, about the end of the fourteenth century, spoke of Sheffield "thwytels" (from the Anglo-Saxon "thwyten," to cut or whittle), and, owing to the city's favorable surroundings, the trade grew to dimensions then considered large and important. It has been described by some as a city founded upon seven hills, and although the writer has never yet been able to see this resemblance to the world's former metropolis, certainly there are plenty of hills and valleys in Sheffield. The latter naturally afforded a cheap

\*A paper read before the American Institute of Mining Engineers.

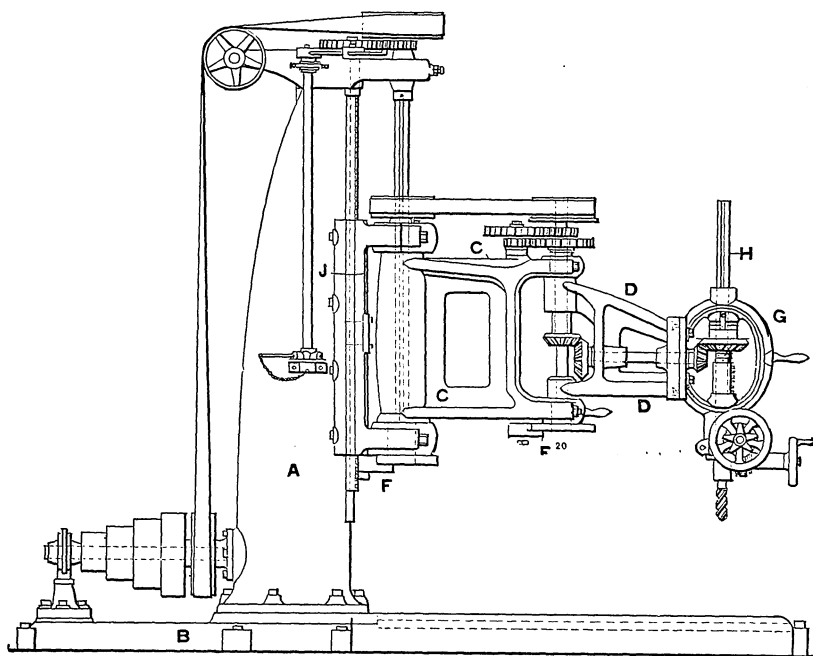


Fig. 2.—Compound Jointed Arm.

### THE BAUSH DRILLING MACHINE.

it is possible for a person with one hand to swing the arm and its equipments with very little exertion. The method of driving the drill is clearly shown in the drawing, Fig. 1. The mechanism for feeding the carriage on the arm D is changeable, so that the carriage may have a quick movement for long traverses of the drill spindle or a slow movement for short and accurate adjustments of the drill spindle.

In Fig. 2 the construction is such that the drill spindle may be swung or revolved about the post and may be turned independently of, and in various directions to, the radial line of extension of the arm from the post. In the drawing C represents the back arm, D the front arm, and G the universal head carrying the spindle H. The two arms are pivoted together and the back arm has a swivel joint connection with the carrier which is vertically adjustable on the column A. The back arm C is held in any desired position by the dog F, and the fore arm D is held in any desired relation in regard to the arm C by a similar dog F<sup>20</sup>. It will be noted that the head G may be swung in unison with the carrying arms, and it may

be rotated about a horizontal axis at right angles to the length of the front arm. The head G is so connected with the outer end of the arm D that it may be swung at any required angle. The method of driving the spindle through the belts and spur and beveled gears is clearly shown in the drawing. The steam shovels for excavating the great Chicago drainage canal have been furnished largely by the Bucyrus Steam Shovel & Dredge Company of South Milwaukee, Wis. They now have 14 shovels of their make engaged in this work and are constructing five more for the same purpose, which will be ready within a few weeks. Four of the new shovels have been ordered by the contracting firm of Griffiths & McDermott and will be, it is claimed, the largest and most powerful machines of the kind ever built. Each will weigh

Among other topics presented for discussion during the coming year by George Gibbs to the Master Mechanics' Association are: "A Decimal System of Gauges for Thickness of Sheet Metal, Tubes and Wire," the committee to confer with manufacturers and others, and to submit a practicable system for adoption by the association. "The Utilization of Railway Scrap Material and Best Method of Handling the Same," "Causes of Bulging in Fire Box Sheets," and "Best Materials for Boiler Tubes and Specifications for the Same."

and easy supply of water power which, in time past, contributed much to the growth of the town. To this day its "grinding wheels," as they are called, gradually dying out with the introduction of steam power, dot the streamlets here and there. Many an American visitor would find it interesting to break his journey at the good old city, and see for himself these interesting reminiscences of the past. Black as it has been painted, and dirty as it may seem to one passing through in the cars, there is no city more picturesquely surrounded—"a black picture set in a golden frame," as Lord Palmerston said.

In the early part of Huntsman's life, about 1740, there was one great drawback in connection with the development of Sheffield. All the materials used had to be imported either from Sweden or Germany. Importation, to an Englishman, does not at all mean destruction to English industries, but in this instance the quality of the imported article was objectionable, for it was variable.

Blister or cement steel was imported from Germany and Sweden, or in some cases the material obtained was a raw puddled or natural steel. A considerable trade was also done with Newcastle-on-Tyne, where several cementation furnaces were worked, probably because the Swedish bar iron more readily found its way there, owing to shipping facilities. Whether these latter furnaces existed when Huntsman first commenced his experiments is not very clear; but in 1774 M. Jars, a French expert, who visited England that year, observed in his interesting "*Voyages Metallurgiques*:" "There are many manufacturers of iron and steel (cemented) at Newcastle-on-Tyne;" and it appears that a considerable quantity went to Sheffield.

Huntsman, being a maker of watches and clocks, often experienced much inconvenience from the irregular quality of the imported blister steel. For fine work of this class the utmost attention is essential to insure uniformity of production.

He was then settled in Doncaster, and from reported proofs of his ingenuity it appears that he was already known as the "wise man" of the neighborhood. It is therefore not surprising to find that his active brain set to work to master the problem from which we today are reaping so great a benefit—namely, the production by fusion of cast steel.

From a recent excellent paper by L. H. Holland, F.G.S., assistant superintendent of the Geological Survey of India, it would appear that Indian Wootz steel, usually found in conical ingots and made by the carburization of wrought iron crucibles (so he states) has been made in India, and most probably for many centuries, especially in Trichinopoly.

Nevertheless Huntsman was very clearly the first to establish a fusion process on something like scientific lines, and to make it a practical and commercial success. Smiles, in his "*Industrial Biography*," gives an interesting account of the discoverer, giving him the full credit after very careful investigations. Moreover, M. Le Play,\* Professor of Metallurgy in the School of Mines at Paris, after very carefully weighing all the evidence obtainable, stated that without doubt the credit of

the invention belonged to Huntsman. Finally a controversy was conducted in the *London Times* some 25 years ago, and the discoverer, as we believe, was again fully vindicated.

Difficult as must have been the problem in the then crudely developed state of knowledge, having set his hand to the plow Huntsman would not turn back. The crux of the difficulty lay in obtaining a fire clay that would enable him to make a vessel or crucible in which the bar iron or cement steel could be made molten. At that time there was practically no knowledge as to the requisite chemical constituents of a fire resisting material. There was uncertainty as to the character of the materials to be used in melting; melting appliances were imperfect, and there was difficulty in obtaining the most suitable fuels. These and other obstacles would have appalled any but the stoutest heart.

Frank Huntsman has informed the writer that evidences in their works were formerly abundant, and even quite recently some have been discovered, of the large number of experiments which had evidently been carried out in the early stage of the process. Buried salamanders are not unknown in the present history of metallurgy, and those found in the works of Huntsman are a proof that as now, so in the past, success usually comes after many trials.

Huntsman's first experiments were made at Doncaster, a town 18 miles from Sheffield, to which city he removed about the year 1740. Here his further experimental work was carried out at Handsworth, a suburb of the town. Finally, he removed to Attercliffe (Otter-on-the-Cliffe), a manufacturing district forming part of the city, and his works are still in existence, considerably altered and enlarged, but situated in the street known to this day as "Huntsman's Row."

The following is a remarkable proof of the high quality of the Huntsman steel. Some manganese steel, made by the writer's firm, was supposed to exhibit less hardness than usual. It was hard, yet it could be drilled, though very slowly, by a particular drill. On inquiry it was found that this drill, which possessed such superior qualities, was made from Benjamin Huntsman's steel. The following was its analysis: C, 1.40; Si, 0.17; So, 0.47; P, 0.017; Mn, 0.18 per cent.

Frank Huntsman has informed the writer that this analysis is typical of the kind of steel produced at the first inception of the system over a century ago, and that the steel above named is manufactured practically in the same manner as then practiced. The analysis given confirms this statement, as it will be seen that the manganese is exceedingly low, showing no signs of "physic" or other additions. It is not intended to convey the idea that the carbon steel above named will tool manganese steel in a manner applicable to commercial wants. A steel that will do that is still lacking.\* Nevertheless it is a remarkable proof of the value of crucible cast steel and of the correctness of the lines worked out by Huntsman as regards the production of a

\* The difficulty in tooling manganese steel does not arise from its hardness alone; it is the combined toughness and hardness of the steel which necessitate much greater force to move the surfaces operated upon and more than the nose of a tool of comparatively brittle material like hardened carbon steel will face. Hence, with very low speeds only can any results at all be accomplished.

special quality of high class steel for tools and other special purposes.

The Attercliffe Works supply to-day the world renowned steel of the same kind and produced by the same methods as those employed more than a century ago. That is to say, cement steel of the purest quality is made homogeneous by fusion and "refined," to use the old trade term. No refining occurs in the true sense of the word; but carbonized bar previously of variable and heterogeneous character (that is, as regards carbon contents) is made by fusion homogeneous and applicable to a large number of purposes for which, previous to this treatment, it was unsuitable. An excellent account is given of the methods originally practiced in Sheffield about 1764 by M. Gabriel Jars, in his "*Voyages Metallurgiques*," edited by his brother and published in 1774:

"Blister steel is rendered more perfect by the following operation. Ordinarily, the scrap and cuttings from articles of steel are used. Furnaces of fire clay (*fourneaux en terre*) are used, of similar design to those for brass castings. They are, however, much smaller and receive the air by an underground passage. At the mouth, which is square, and at the surface of the ground, there is a hole through the wall, from which ascends the chimney stack. These furnaces contain only one large crucible, 9 to 10 inches high and 6 to 7 inches in diameter. The steel is put into the crucible with a flux, which is kept secret, and the crucible is placed upon a round brick, set upon the fire bars. Coal, which has been reduced to coke, is placed round the crucible and the furnace is filled. Fire is then put to it, at the same time the upper opening of the furnace being entirely closed with a brick door surrounded by a circle of iron. The flame goes through the pipe into the chimney.

"The crucible is five hours in the furnace before the steel is perfectly melted. Several operations follow. Square or octagon molds, made in two pieces of cast iron, are put the one against the other, and the steel poured in at one extremity. I have seen ingots of this cast steel which resembled pig iron. This steel is worked under the hammer, as is done with blister steel, but is heated less highly and with more precaution because of its liability to break.

"The object of this operation is to make the steel so homogeneous that there may be no flow, as perceived in that which comes from Germany; and this, it is said, can only be done by fusion.

"This steel is not extensively used; it is used only for purposes requiring a fine polish. Of it are made the best razors, some knives, the finest steel chains, some watch springs and small watch makers' files."

The following passage, in another part of the same work, shows that attempts were being made in Newcastle, as early as 1765, to imitate Huntsman's methods:

"We are told also that in the southern part of England, that is, south of Newcastle, old files, or other old steel articles, or blister steel, are cut into pieces and put into a crucible with a flux, which is kept secret. It is said that each workman has his particular recipe. These crucibles are placed in a furnace to melt the steel. One person in particular has undertaken this process, 2 miles away from this town (Newcastle), but he has succeeded badly."

No doubt Huntsman's attention was at first confined to the supply of a material suitable for the purposes of his own immediate business, that is, clock

\* "*Memoire sur la fabrication de l'acier en Yorkshire*" and "*Memoire sur la fabrication du commerce des fers et aciers dans le Nord d'Europe*,"—*Annales des Mines*, vols. iii and ix, fourth series.

springs; but it could not have been long before he saw the further important applications and uses that awaited the eventual development of this process, of which the fusion processes of Bessemer and Siemens are really the offspring. All these processes are dependent upon a knowledge of the properties of different steel alloys, confined in those early days to carbon steel. It is highly probable that future generations will be largely dependent in their material progress upon a thorough and more exact knowledge of this branch of metallurgy.

Huntsman exported his steel to France, a trade still held by his firm. Sheffield cutlery became jealous of the advantages they thought his steel offered to foreign competitors, and it is said that they tried to influence the government of the day, but, fortunately, they failed in their attempt to restrain trade.

That the process soon spread is shown by a Sheffield directory, published by Gale & Martin in 1787, that is, about ten years after Huntsman's death. A list of steel manufacturers is there given, from which it appears that in addition to Huntsman's firm, then trading under the name of Huntsman & Asline, as steel refiners and melters, there were several other firms already engaged in the same business. The directory states that five firms were engaged in melting or refining and about a dozen in the converting or cementation process.

That Sheffield can pre-eminently claim the title of "Steelopolis," not less from its modern development than from its long standing and traditional associations with the early developments of the metallurgical industry of iron and steel, is shown in an interesting manner by the same directory. We find that there were then some half dozen manufacturers of adzes and hammers; about 50 makers of edge tools; not less than 40 engaged in file making; over 300 in pen, pocket and table knife manufacture; at least 50 in razor making; close upon 100 in scissors, and some 60 or 70 in the manufacture of scythes, sickles and shears. Many of these were, no doubt, small workers rather than owners of large concerns; but it will be seen that here was the center for a considerable employment of steel. It was this, no doubt, that induced Huntsman to settle in Sheffield. The advantageous environments also proved to be of the greatest assistance in its rapid development. For example, its excellent supply of very pure water (also a source of cheap power) was believed by some to be of special quality and efficacy in the hardening of steel.

In these days of investigation, many of the old ideas on these subjects have been exploded, and probably there is nothing in Sheffield water that cannot be obtained elsewhere, at least from water showing upon analysis the same chemical composition. Yet, not very long ago, a considerable quantity of Sheffield water was exported to America for hardening purposes.

It is curious that the ancients not only thought that the quality of the water was the most important factor in obtaining the right quality of steel, but that the Latin and Greek word for steel, *Chalybs*, was believed to have been given to a Spanish river (known to-day as the Cabe) in the Royaume de Galice, which flowed into the Vélézar, and the water of which had the reputation of conferring the best kind of hardening upon steel. M. Duhamel, a clever metallurgist of the last century, pointed

out the foregoing in his "Encyclopédie Méthodique de Chymie et Métallurgie," published in 1786. It is, of course, well known that the original "Chalybians, a people of iron workers," mentioned by Herodotus in the fifth century B.C., lived in Armenia, on the shores of the Black Sea.

Sheffield's proximity to supplies of excellent stone or millstone grit, from which grinding and other stones, so largely used in the city's industries, are obtained, has been of considerable advantage. These grindstones have been in demand in many other countries.

In the same way, the well-known Sheffield ganister and fire clay of excellent refractory quality appear to have been placed by nature just where they were likely to be wanted. In fact, Sir Henry Bessemer owed to this fact much of his early success. Sheffield ganister is still exported world wide.

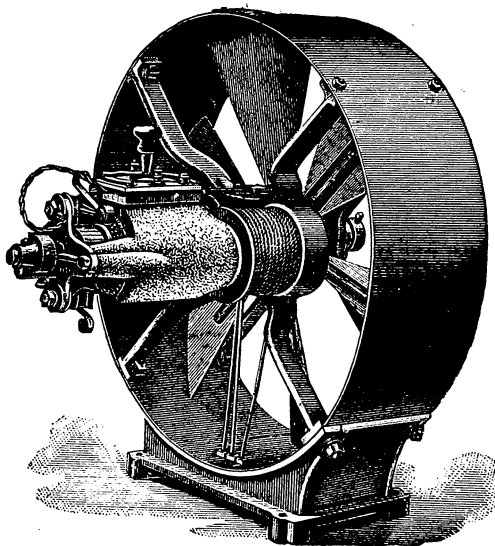
Many of the names given in the directory of 1774, as connected with steel and hardware, for example, Spencer, Jessop, Peace, Wilkinson, Parkin,

crucible cast steel are melted per week in Sheffield. Huntsman would indeed be startled to find his child grown into such a giant.

America has developed the fusion of cast steel by gas melting furnaces and, with the kindly help of nature, in the wonderful application of natural gas. But without such aid, Sheffield now uses weekly some 14,000 clay crucibles in which to fuse its steel. The quality of this steel still stands unsurpassed in the markets of the world, and the main principles in the production of it are those brought into practice by Huntsman.

#### -Electrically Driven Ventilating Fan.

The Huyett & Smith Mfg. Company of Detroit, Mich., make a fan designed to be driven by either a pulley or electrically, by means of what is known as the Fuller patent electric motor, which is provided with a three-speed switch.



ELECTRICALLY DRIVEN VENTILATING FAN.

Turner, Rodgers, Tyzack, Sanderson, Hobson and others, are to-day still household words in the world's markets. A proud record, for these are Hallamshire men, who, after a century in the troublesome world of business careers, still continue, with the assistance of their sturdy Yorkshire workmen, to keep the name of England to the fore, both as regards quality of material and excellence of handicraft. Their aim has been truly represented by the motto of the City's Cutlery Company, founded in 1624: *Pour y parvenir à bonne foi*.

In 1835 there were 56 converting furnaces and 534 melting holes; in 1842 there were 97 converting furnaces and 777 melting holes; in 1846 there were 105 converting furnaces and 974 melting holes.

In 1848 the ratable value was £272,000; in 1893, £1,250,000.

The small beginnings of a century or more ago have expanded into a commerce of very large proportions. There are now over 250 different steel manufacturers and suppliers in the city; also nearly 1000 representing the cutlery, edge tool trades, and those engaged in other miscellaneous branches of manufacture, such as saws, files, &c. In times of ordinary trade, probably more than 1000 tons of the best quality of

The pole pieces of the motor being parallel with the fan shaft, the spider or arms of the fan frame being utilized as a keeper of the two magnets, the breaking space of the poles is brought into a vertical position, removing all danger of short circuiting the magnetic lines of force across the poles, which is done by the fan blades in the use of an ordinary motor. The commutators are built of numerous sections thoroughly insulated with mica, which is an additional safeguard against short circuiting and "burn outs," from which no difficulty is experienced in the use of this motor. This combination of motor and fan are kept in stock with motors wound for 110 and 220 volt currents; they are also furnished wound for any voltage.

A very tangible straw which indicates the direction of the tariff wind, as affecting the Sugar Trust, is seen in the announcement that the chartering of steamers to load sugar at Cuba for New York, Philadelphia and Boston for the last three weeks has been the largest in the history of the trade. The corporation has already engaged, it is said, a year's supply of raw sugar, if not more, which will be stored for future requirements.







friction to raise the ram, which, however, falls and slides the cord over the pulley when no downward pull occurs at the other end. In Fig. 20 is shown a drop press with a roller lifter for the ram; and in Fig. 21 a crank lifter drop press. The rollers and crank are respectively driven by power, the rollers being separated when the ram is to drop, or, in the other case, the crank being thrown out of gear with its driving shaft. Fig. 22 shows a pneumatic, steam or hydraulic press, the ram being driven in one or both directions by a piston in cylinder *c*. In Fig. 23 is represented one form of a magnetic press, where the ram is actuated by a solenoid consisting of a bar of iron, *s*, which is drawn into a helix, *h*, or its

clumsiness possible in the bed, ram and parts adjacent thereto, to give plenty of the anvil principle; that is to say, plenty of inertia to resist sudden blows without undue vibration. 6. Convenience of manipulation both in operation and adjustment. 7. Ample length of adjustment in the ram and other members having variable positions, together with plenty of die room in general. 8. Beauty and harmony of general design. This latter point may be sneered at as of no practical consequence by some non-esthetic Philistines whose souls are but part way civilized. Such men, however, must sometimes buy presses. For their financial benefit I will say that, in the long run, those machines which are the most artistically

## Do Iron and Steel Crystallize in Service?

BY PAUL KREUZPOINTNER, ALTOONA, PA.

At this late day, when iron is disappearing before the onward march of soft steel, we still meet with discussions of the old and well worn theory that iron becomes crystalline in service. Shocks and vibrations, it is assumed, change the fibers of the iron into their primary form of crystals. Since, in all probability, iron will always be used for some purposes, and, what is more important, since the claims relating to crystallization during service are being transferred to steel, there is evidently

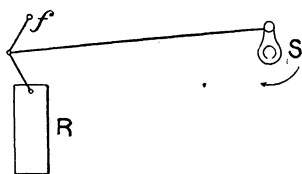


Fig. 12.

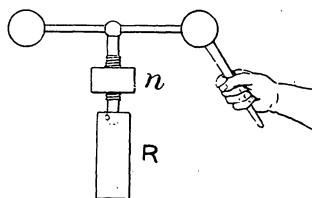


Fig. 17.

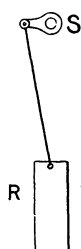


Fig. 13.

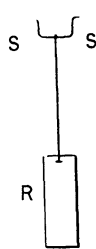


Fig. 14.

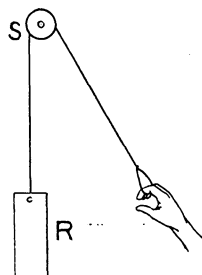


Fig. 18.

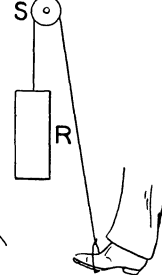


Fig. 19.

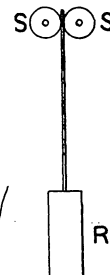


Fig. 20.

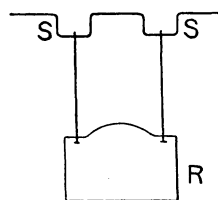


Fig. 15.

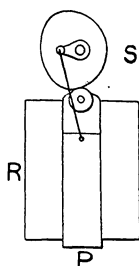


Fig. 16.

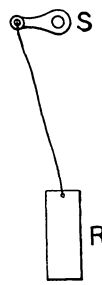


Fig. 21.



Fig. 22.

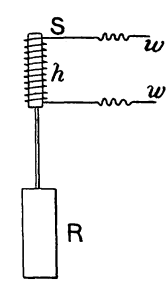


Fig. 23.

## PRESS WORKING OF SHEET METALS.

equivalent, when a current of electricity is passed through the wires *w w'*.

### Advice to the Buyer.

In general, a few of the most important points to be considered by the purchaser of a press are as follows: 1. A great excess of strength and rigidity, that it may not break down or spring unduly from its normal shape. 2. Great length to the ram and ample surface of the proper shape upon its bearings and the parts of the frame which confine and guide it. 3. Accuracy of workmanship, especially in regard to the ram and its relations to the bed. 4. Durability, as secured by ample proportions in the smaller details and by sufficient bearing surfaces upon all the wearing parts, together with proper material, properly hardened where necessary. 5. All the

proportioned will, necessarily, have their materials so located in detail as to do the most good for the least money. They will, therefore, be the strongest and most durable.

Concessions have recently been granted by the Mexican Government for two new lines of steamships, one to trade between ports on the Gulf of Mexico, with the privilege of extension to the United States and Europe, and the other to ply between ports on the Pacific coast and the United States and Central and South America. The Gulf line will have seven steamers and the Pacific line five steamers of between 1000 and 4000 tons. The lines are to be in operation within two years from the date of the concession.

still room for its discussion, all the more so because the firm belief in a theory of this kind cannot but hinder the proper understanding of the properties of iron and steel. It is apt to prejudice the interests of the producer and consumer as well. The weak point in the crystallization theory is the utter impossibility of bringing tangible proof that the material has not been crystalline at the point of fracture before it broke, or anywhere else, for that matter. The fact alone that even in rolled iron of fairly good quality only 1½ inches thick crystalline spots, and even in thinner iron than this crystalline streaks, are found often enough imbedded between fibrous metals is evidence in itself how very probable and certain is the presence of pockets of crystals in structural material of larger

dimensions, such as beams, shafts, axles and the like. In hammered material, which is more likely to carry scrap in greater or less quantity, crystalline formations of varying sizes are more apt to be formed than in rolled iron. Crystalline streaks in  $\frac{1}{2}$  and  $\frac{3}{4}$  inch thick flat iron may even be found.

The fact that an axle or a structural member of any kind broke with a crystalline fracture, though the previous tensile or nicking test, or both, showed fibrous iron of good quality, proves nothing whatever in favor of the crystallization theory.

In the first place, iron of the kind used in structural work is never so uniform as to be fibrous throughout its mass in the same piece, much less so in the several pieces or members of the same group. This is most decidedly not the case if scrap or cold short iron was used, which latter crystallizes so easily on slow cooling. Large crystals occur, whose breaking up into fibers requires more work than with iron of finer structure. In the second place, the iron was not tested at the point where fracture took place subsequently, thus, even if it was fibrous at the point tested, there is nothing to show that it was not crystalline to a greater or less degree at the point where it broke. In the third place, the iron may have been crystalline at the point tested but assumed a fibrous appearance at the point of tensile fracture, due to the flow of the metal during the process of testing. Because this flow makes a fractured surface appear fibrous it is a gross self deception to jump at the conclusion that the iron must be fibrous throughout. Nor is the inference warranted that the iron because it appeared fibrous when tested must necessarily have undergone crystallization in service if it should happen to have a crystalline fracture years after at a widely different point or in a bar, beam, axle, &c., which perhaps was not tested at all.

As a matter of fact the fibrous appearance of the tensile fracture is no proof that the iron is fibrous. The tensile test, valuable and indispensable as it is as a measure of strength and ductility, has been overrated as a measure of quality. It is a self deception to assume that the fractured ends of test pieces must of necessity show crystalline if there are any crystals in the iron. Unless the iron was "rank" cold short, or the crystals contained in the iron (if any) are unusually hard, or the iron was highly heated and subsequently insufficiently worked, then the fractured ends of tensile test pieces will not reveal the presence of crystals, if there are any close by, but will be fibrous.

In a tensile test the metal is allowed considerable time to flow, during which process the individual particles are pulled out of their original position and pushed along past each other toward the final point of rupture. While the particles are passing each other they are subjected to pressure from all sides and reduced in size, with a corresponding elongation in the direction of flow. At the point of greatest reduction of area this pressure and elongation is of course greatest; sufficiently so to reduce crystals in iron to fibers at the point of rupture, or coarse fibers to fine fibers, or coarse crystals to finer crystals. Thus the reduction of area at the point of rupture in a test piece by 30 or 40 per cent. or more in soft steel is equal to so much more work put on the material by hammer or roll, with the inevitable change of structure from what it

was at that place before the test commenced. The longer the time given for the metal to flow, or the easier the metal is flowing of its own nature, the greater will be the difference of the fracture in a tensile or nicking test from the texture of the metal in the body of the piece which did not flow.

Often has the writer followed the changes taking place with a "pocket" of crystals in iron from the body of the test piece to the point of rupture, where either every trace of crystallization had disappeared or remained visible but slightly, while a few inches from the point of rupture in the body of the piece the defenders of the crystallization theory would have found crystals and would have insisted that the iron had crystallized in service, while in fact the iron had just come from the rolls and had never received any other shocks or vibrations except what it experienced in the car while being shipped from the mill to its destination. Or do the friends of the crystallization theory have as great faith in the efficacy of a car jolting over the road as a crystal producer as that inspector had who accepted kinked rails and ordered them loaded "because the jolting of the car would straighten them out by the time they reached their destination."

But while in a tensile test the fractured surface will from the nature of the case show the iron better than it really is, in a nicking test the iron has a tendency to show worse, so much so that, given the proper conditions, the finest stay bolt iron can be broken granular, or crystalline if you please, giving the fracture the appearance of steel. Here then we have another factor which the friends of the crystallization theory do not seem to take into account. This is that iron when broken transversely will show any crystals that may have been in the iron, and when broken transversely under proper conditions the fibers also will give the appearance of fine crystals or granules, all of which leads the unwary to jump at the conclusion that the iron has been vibrated back to its primary crystalline condition. This self deception is all the more easy since an axle, shaft, beam, &c., breaks transversely, and it should not be forgotten, in most cases breaks suddenly, which tends to produce the crystalline appearance of the break. In connection with this it should not be forgotten that a nest or streak of crystals imbedded in a layer of fibers must disturb the continuity of structure, with a consequent weakening effect at that point, which makes it liable to break right there.

The designer and engineer had made no allowance for the weakening effects of "pockets" and "streaks" of crystals in the iron, or cold short iron which may be crystalline all through. Perhaps he took it for granted that all iron must be fibrous after rolling or hammering according to the book, and he designed according to the book. Iron does not break "in detail" like steel, it lets go at once. It has greater resilience than steel, but less ductility transversely, and appears to get "fatigued" more easily than steel, which would account for its letting go suddenly when under transverse stress.

According to the laws which govern the forming of crystals there must be fusion or semi-fusion, a dissolution of the component elements of a body, to allow the formation of a new body or crystal, according to the natural affinities of the respective elements. Heat and water, either alone or in combination, are the only solvents which allow of the setting

free of the chemical constituents of a substance to form new bodies which we call crystals. But what does the crystallization theorist try to make us believe?

Solid substances like carbon, manganese, silicon, &c., are expected to leave the body of the fiber of which they are component parts and seek new relations, causing necessarily a loosening of the cohesive grip which holds them together, shortening up the fiber in one direction, swelling out in another direction, forming facets and rearranging their position. All this is to take place while the iron is cold and while the metal holds up great loads, which, perhaps, are in rapid motion, tugging and pulling and twisting and jerking every fiber in that iron structure. Curiously it never breaks until this whole regenerating process is completed, until the structure is reformed and is able to present itself in its new dress and changed relations. How does it come that the friends of recrystallization have never produced a case, or cases, of the formative period—of the period of transition of the fiber into crystals? If the theory of carbon or other metalloids changing their form and relations in a cold state when being shaken is correct, then we ought to be able to make blister steel by putting iron and charcoal into a tumbling box and shaking it until the iron has absorbed the carbon and changed to a steely texture. Case hardening might also be accomplished by sprinkling bone dust on the articles and tapping them until the carbon has eaten into the iron, like the worm said to have appeared in Germany eating itself into steel rails and growing fat on phosphorus, silicon and other like palatable substances, such as are found in steel rails. How the manufacturers of malleable iron would welcome this new method of decarbonizing the castings by driving the surplus carbon out in a shaker or rattler!

The investigations of Chernoff, Brinell, Osmond and Werth, Ledebur, and others equally high in authority, teach us that below a certain temperature no change of carbon in iron and steel takes place. To change the carbon from one form into another form requires either a sudden high heat or long continued or oft-applied low red heat. But the application of heat below yellow or bright red changes the texture of metals from coarse to finer, or from fine crystalline to amorphous. Thus all the knowledge we have of the influence of heat on the texture of metals goes to prove that this agent, at least, would not change the fibers of iron into coarse crystals, but would have a tendency to make a coarse texture finer. This knowledge, moreover, is practically applied more and more by annealing structural material, axles, &c., to break up coarse and irregular texture. The well known "Coffin" process of toughening axles is an example.

Thus we have to leave heat out of consideration in arguing in favor of the recrystallization of iron and steel in service. If we turn our investigation to the possible effects of stresses and strains on the texture of metals, the friends of the recrystallization theory get also very little consolation.

Dr. Wedding, in discussing "The Properties of Weldable Iron as Deduced from the Microscopic Examination of its Structure" before the Iron and Steel Institute, says: "If pressure is exerted upon a crystal (in iron and steel) from one side only, then that crystal is crushed flat, forming a scale. If, however, pressure is exerted on two of

its sides, then the crystal is lengthened into a fiber, as it is called in practice, though in reality the product is only an elongated crystal. A confirmation of this we can obtain with the microscope, especially with soft wrought iron. Parallel with the fiber we can follow the single strands, while a transverse section shows no elongation at all in either direction. This also explains why a transverse fracture of wrought iron appears granular or crystalline to the eye. However, a fiber cannot be formed beyond a certain length. This depends upon the amount of carbon. If this is 0.5 per cent. or more, then the fiber breaks up again into crystals on the slightest attempt to stretch it. If the carbon is low, but the phosphorus, silicon or sulphur is high, then we observe the same effects. If when in this condition the fiber is stretched it breaks up again into crystals, which, of course, must always be smaller than those out of which they originated. This phenomenon can be observed better with the pocket lens than with the microscope. The fact that steel and certain kinds of iron produce no fiber is well known in practice. The influence of phosphorus to produce crystals is so characteristic that its presence is to the expert a guide in taking samples from the converter.

This fact also teaches us that through no influence whatever, except through the influence of high temperature, can a fibrous iron be converted or changed into a coarse crystalline iron. The conversion of fibers into crystals of a larger size than the original fiber by means of shock is, therefore, a delusion and must be considered a fable. The fracture of iron can show only a crystal equal to the transverse section of the original fiber, or a smaller crystal if, during the process of hammering or rolling, the crystal or fiber has been stretched. This fact, however, has already been amply demonstrated by the experiments of Woehler and Spangenberg. Spangenberg says: "I doubt whether every strain, and consequently the first strain, will change a crystalline structure into an amorphous one, because test pieces which broke after the application of a few stresses still appear crystalline. However, the smooth and shiny surfaces of the various grades of steel prove that the texture becomes finer and the amorphous condition becomes more pronounced the more numerous the stresses were before fracture took place. Under like circumstances, in iron fractures the breaking up of the larger crystals into smaller ones becomes apparent, giving the appearance of flow."

"On the basis of my examinations of the appearance of fractures, I must oppose the belief of iron becoming crystalline through the effects of repeated stresses, an opinion which is entertained by many engineers. Pulling and bending tend to break up a crystalline structure, changing it to amorphous."

Woehler made experiments with the view to produce crystalline texture of fibrous iron by intermittent striking of test pieces which continually revolved under stress, thus producing shocks of a nature which are supposed to produce crystals in iron. The results of such treatment were indifferent as far as crystallization was concerned, but it showed that the iron was more liable to break under those circumstances. That this should be so is quite natural when we consider how the slag and other foreign matter in the iron prevents the

closest possible cohesion between the fibers of the iron. A combination of shocks and stresses would have a tendency to disintegrate the slag and loosen the structure of the metal, thus weakening it perceptibly. It is this greater liability of iron and steel to break when subject to alternating and intermittent strains, and the possibility of which is not always taken into consideration by the designer, which undoubtedly causes unexpected breakages of structural parts, which would not break if they were subjected to the strains acting in one direction only.

As a result of Woehler's experiments on the fatigue of metals he concluded that "members of structures which are subject to alternating strains, pulling and pushing, or bending and twisting alternately, ought to be made larger or stronger in proportion of 9:5 than such members which are subject to strains in one direction only."

If, in addition to these now well established conclusions, we consider the fact that broken material, the fractures of which give rise and support to the theory of recrystallization of iron and steel, had been subjected probably to alternate and intermittent stresses, which stresses, according to Woehler and Spangenberg, tend to deteriorate and "fatigue" the metal, and furthermore, if we consider how with insufficient dimensions and impaired cohesion, sudden shock will produce sudden fracture, then we have all the elements necessary to produce the well known crystalline appearance of the fractured surfaces. The fractures will thus appear crystalline even if the iron were ever so fibrous, because of the suddenness of rupture, which did not allow the metal time enough to flow, giving consequently a clear transverse break of the fibers, which, as already explained, are nothing but elongated crystals, the transverse sections of which are the measure of their sizes.

If, however, there were crystalline spots or streaks in the iron, then the conditions for fracture at the points where these crystals exist become more favorable still, because to the forces which tend to weaken the iron must be added the natural weakening effect of a break in the continuity of structure in the metal because of the interposition of crystals among the fibers. The reason for this is that the cohesive force of the particles which compose the crystals is greater than the adhesive force which holds the mass of the crystals together. The larger the crystals the less in proportion is the strength of the metal. Hence the greater strength of fibrous iron or steel with a fine, granular texture.

The late John A. Roebling is quoted as saying on this subject ("Journal" of the Franklin Institute, Vol. XL, p. 61): "A molecular change, or so-called granulation or crystallization, in consequence of vibration or tension, or both combined, has in no instance been satisfactorily proved or demonstrated by experiment. I further insist that crystallization in iron or in any other metal can never take place in a cold state."

Fairbairn is quoted as saying, after describing the effects of heat on iron: "The fact is, in my opinion, we cannot change a body composed of a fibrous texture to that of a crystalline character by a mechanical process, except in those cases where percussion is carried to the extent of producing considerable increase of temperature. We may, however, shorten the fibers by continued bending, and thus render the parts brittle, but certainly not change

the parts which were originally fibrous into crystals."

In Ledebur's "Handbuch der Eisenhüttenkunde," page 660, the author thinks the question whether iron will crystallize under shocks and strains must be answered in the negative. Ledebur cites Bauschinger's investigations on that subject in 1878, when the latter examined and tested the links of a chain bridge which was built in 1829. There being some reserve links on hand which had never been in service, it was possible in this case to make direct comparison with the material before and after its use. No difference in texture between the iron of the links having been in service 49 years and those having never been in service was observed. Both showed fibrous iron. The strength was as follows, average of three tests:

	Elastic limit. Pounds per square inch.	Tensile strength. Pounds per square inch.	Elongation in 8 inches.
Reserve links	28,100	44,400	0.8
New links made at the same works.	28,500	52,300	5.1
Links taken out of bridge	28,700	47,500	6.4

Bauschinger also tested some iron bridge bolts from a railroad bridge which had been in service for 25 years, without, however, observing any deterioration in texture or strength. The average result of several tests of these bolts was:

	Elastic limit. Pounds per square inch.	Tensile strength. Pounds per square inch.
Before put in service.	28,000	44,400
After 25 years of service.....	28,600	44,100

To assure oneself how new iron, especially pieces of large dimensions, are already crystallized before such iron goes into service, a piece of such iron, planed, polished and etched, will give undoubted evidence of the crystalline conditions existing before the iron was ever subjected to any strain.

As remarked at the beginning of this article, it would hardly be worth while to take the old superstition about the crystallization of iron under shock and vibrations seriously at this late day when steel has displaced iron in structural work to such a large extent, if it were not for the fact that this superstition is being transferred to steel. This is really a misfortune to the constructing engineer who may happen to believe in it, and to the consumer of steel in general. Steel is a more complex metal than iron, is more easily injured by heat, and though it can stand a large amount of bad mechanical treatment, it presents rather puzzling features sometimes, puzzling to the uninitiated and to those who are ever ready to jump at conclusions in regard to the behavior of metals; and thus there is danger of overheated, segregated, badly "teemed" steel being set down at once by the crystallization fiend "as a clear case of crystallization under shock," if such steel should happen to break at the wrong time and place, as it most likely will.

All our knowledge of the properties and behavior of iron and steel under heat, stress and strain warrant the conclusion that:

\* Ueber das Verhalten der Metalle bei wiederholten Austreibungen.

1. Crystals are the product of the solidification of chemical elements through their cohesive attraction.

2. Dissociation or dissolution, by means of heat or moisture, of the chemical elements in the body in which they are combined for the time being, to set them free and change their form must precede the process of cohesive attraction and subsequent formation of crystals.

3. Such dissociations and change of form of the chemical elements of carbon, &c., combined with the iron will take place only under the influence of heat.

4. "Cold short" (high phosphorus) scrap mixed with the "pile," overheating of the "pile" or ingot (if steel) and subsequent insufficient work to break up the crystals formed, or finishing the article at a high heat, such as die forgings, will leave the metal in a state of crystallization or produce nests or streaks of coarse crystals, with a consequent weakening of the article at that place.

5. The manner of breaking may produce crystalline appearance of the fracture though the metal may be finely fibrous uniformly throughout its mass.

6. Iron and those classes of steel which are supposed to be capable of crystallizing under shock and vibrations will not break until long after the primary or original elastic limit and the yield point have been passed and the metal has "flowed" more or less.

7. The natural and inevitable consequence of "flow" in iron and steel is to break up and reduce the size of crystals and fibers; hence,

8. The forces which operate to break and destroy a structural member of whatever kind are directly antagonistic to the formation of crystals out of fibers, these forces being fiber producers, as it were, from the moment they become active until the point of rupture is reached. This tendency is

to make them smaller instead of making them larger or permitting the formation of a new structure.

### The Browne Tapping and Drilling Machine.

Thomas I. Browne of St. Johnsbury, Vt., builds a machine so designed that it may be mounted in various positions in connection with ordinary lathes, drill presses, vises, &c., for the purpose of tapping and drilling holes. The several

to the work to be done, as indicated in the drawings. On the inner end of the shaft, driven by the lathe spindle, is a beveled gear meshing with both of the opposite and reversely disposed gears E and F. Each of these gears is provided with a gear sleeve hub journaled in bearings formed in the frame. The upper hub D is longer than the lower one and is formed with a slot by means of which connection is made with the spindle of a drill press, Fig. 4, so as to form a spline connection of the machine with the spindle, whereby the

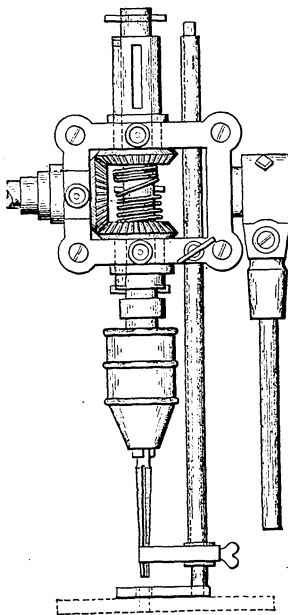


Fig. 1.—Tap Entering Work.

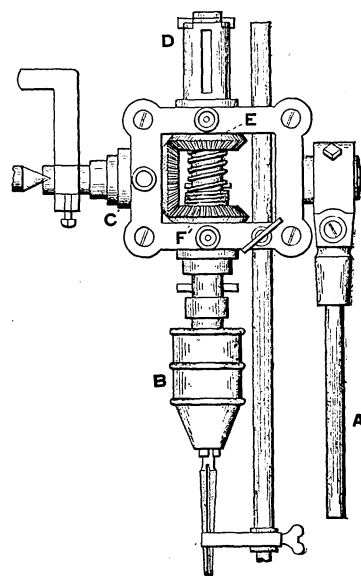


Fig. 2.—Tap Being Withdrawn.

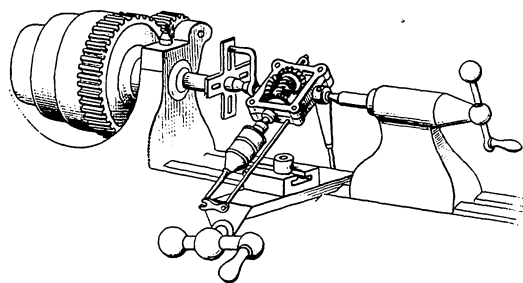


Fig. 3.—Drill Centered in Lathe.

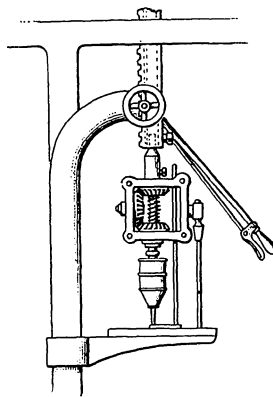


Fig. 4.—Drill Connected with Drill Press.

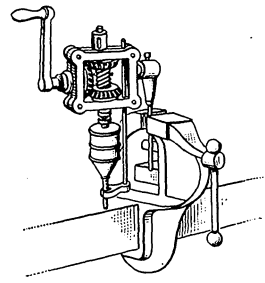


Fig. 5.—Drill Held in Vise.

### THE BROWNE TAPPING AND DRILLING MACHINE.

increased as the point of rupture is approached, since flow is most rapid in iron and steel just before the metal breaks, as is proved by the reduction or contraction of area at the point of rupture. It is still further proved by the amorphous condition of "detail" fractures of iron and steel.

9. All of the foregoing goes to show that the theory of the crystallization of iron and steel under stresses and strains is based upon a misconception of the nature and properties of these metals, because low heat, or the heat that can possibly be produced in service, as well as stress and strain, with their analogous effects to mechanical work produced under hammer and roll, all tend to break up crystals in iron and steel,

parts of the machine are carried by a rectangular frame, provided at the right hand side, Figs. 1 and 2, with a rounded stem formed with a recess adapted, in certain cases, to receive one of the centers of a lathe, as shown in Fig. 3. Opposite this stem the frame is provided with the bearing opening and collar C to receive a short shaft formed at its outer end with a recess to receive the opposite center of the lathe. Adjustably attached to the outer end of this shaft is an angled chuck arm arranged to engage the lathe face plate. This construction provides for transmitting motion from the lathe spindle to the tapping or drilling devices. The adjusting arm A is provided to hold the device at any desired angle in relation

entire machine will be fed onto the work by the thread of the tap. In drilling, the feed of the spindle carries the tool through the work. The tool spindle is normally held in an inactive position within the gear hubs by means of a centrally arranged spring coiled around it and having its ends resting against the opposing faces of the gears E F. Passing through the spindle at the center of the spring is a pin which prevents the spindle from slipping into engagement with either of the sleeve hubs except when forced into engagement during operation. The chuck B is attached to the lower end of the tool spindle. Pins passing through the spindle are designed to engage in notches formed in the ends of the hubs,

thus making either of the gears E F the active one, as may be desired. The machine is provided with an adjustable stop for regulating the depth of hole. The work of tapping and drilling will be understood.

After the machine has been hung on the lathe centers, as described, it is only necessary to adjust the stop arm in order to regulate the depth to which it is desired the tool shall enter the work, and then the work is fed onto the screw tapping tool by hand or other suitable means. As the work is pressed onto the tool, the tool spindle is moved so that the engagement pins are forced into the notches of the lower sleeve hub. Motion is communicated to both of the gear wheels, E and F, from the drive gear wheel C, but the wheel F is at this time the only active wheel, inasmuch as the tool spindle is connected therewith, as clearly shown in Fig. 1, thereby communicating motion to the tool spindle in a direction which causes it to force the screw tapping tool into the work and thread the hole. When the work reaches the stop arm the further advance of the work on the tool ceases, and the further rotation of the tool spindle necessarily draws down the engagement pins out of the notches of the lower hub, and thereby causes the tool spindle to stop its rotation inasmuch as it is now not engaged with the hub of either of the wheels. The work, with the tapping tool or cutter in it, is now drawn away from the machine so that the engagement pins at the outer end of the tool spindle are pulled into engagement with the outer notched end of the upper sleeve hub, as may be seen in Fig. 2 of the drawings, so that the tool spindle will be caused to rotate in an opposite direction, and "back" the tool out of the work.

The drawings, Figs. 3, 4 and 5, show different applications of the machine.

#### San Francisco News.

The war about the material of which the City Hall tower shall be made is probably over, but it has raged to some extent during the past couple of weeks. The contractors, O'Connell & Lewis, agreed not to use Eastern ingot steel and have it rolled here. The idea of rolling it at the Judson Iron Works was given up, and satisfactory arrangements were made with the Pacific Rolling Mills. This institution started to do the work, and it was thought that everything was settled; not so, however, the genius of discord seemed to hover over the work, and again objection was made. It was now stated that Chinese scrap steel was being used, and again there was some trouble. Mr. Noble, the manager of the rolling mill, has, however, come to the rescue. He states that the steel used is made from Pennsylvania pig iron, Shasta County iron ore and cable steel, which are melted and made into ingots for the blooms. He states that the City Hall inspectors are at the works every day and can verify the truth of what he says. The fact of using Pennsylvania pig iron will help to account for the large quantities of pig iron coming this way for some time past, and as regards the Shasta iron ore it is the first time in many years that it has been used in any way. At one time there was quite a considerable demand for Clipper Gap iron, and there were large sums spent in its development. It was on the market here for many years and always commanded the highest price, but the iron market commenced to decline, and soon it could not be manufactured at

the price at which English, Scotch, French and Eastern could be sold; as a result the work of production was stopped after it had resulted in a very heavy loss to all engaged in it. If the rolling mill could in any way again utilize the rich deposits of Shasta it would confer a benefit on the whole State.

The cruiser "Olympia" is fast approaching completion, and she will be ready for her trial trip in a few weeks. She has already had a preliminary trip on the bay and did very well. Indeed, it is expected that she will make over 22 knots, and that her builders will receive a handsome bonus. This will be \$50,000 for every knot she makes over

sold in this market, but Oregon has taken a back-seat here for some time.

Business, as a rule, has been quiet, as is usual at this time of year. Sales have, however, been somewhat less than they were a year ago. The outlook for the fall trade would be good where it not for the price of wheat, which continues unusually low, 25 per cent. less than it was a year ago. Our wheat and barley crops may be somewhat less than in 1893, but the prospects of the harvest which were not good not very long since are improving every day. Then our fruit crop will be the largest on record, while prices will be at least as good as they were last year. All this should insure a reasonably good busi-

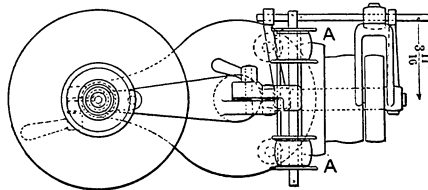


Fig. 1.—Plan.

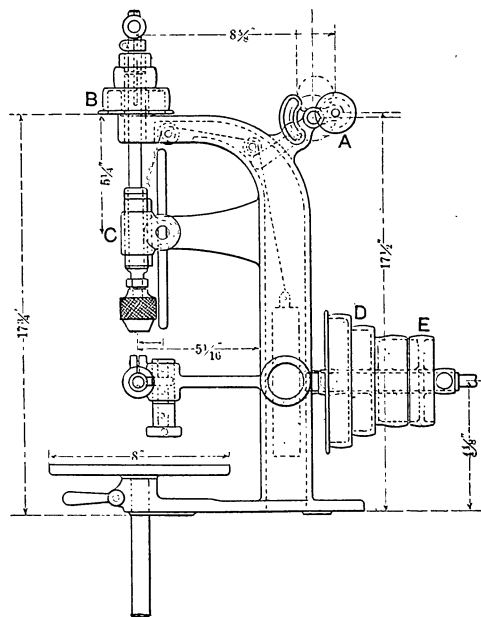


Fig. 2.—Side Elevation.

#### SENSITIVE BENCH DRILL.

the speed specified in the contract. The "Olympia" will be a magnificent vessel. It is unfortunate that at this time the conductors of the Union Iron Works should make any attempt to excuse the laches with which the Carnegies are charged, for we had begun to build up quite a reputation in the line of shipbuilding. In fact, considering our opportunities, we had done wonderfully well. I believe, if we had been given the chance, we could have made plates here as well as in Pennsylvania, but at that time every one would have sworn by the Carnegies. The Government should so dispose of its work in this line as to give San Francisco, California, even Oregon, a chance, as our sister State has some of the finest iron ore and some of the best iron in the world. Our foundries have used a good deal of it from time to time, and they all pronounce it good. A great deal of pipe manufactured from it has been

ness, and doubtless it will, but conservatism is in the atmosphere and rules business circles.

#### Sensitive Bench Drill.

D'Amour & Littledale of 204 East Forty-third street, New York, have designed a sensitive bench drill for light rapid drilling up to holes  $\frac{1}{8}$  inch in diameter. The spindle is driven by a 1-inch belt, which is guided to the two-step cone B by the flanged guide pulleys A. These pulleys are mounted one at each end of a shaft carried by an arm, which may be shifted in order to guide the belt to either the upper or lower step of the cone. The spindle has a cut steel rack and pinion feed, and an adjustable stop is provided for gauging the depth of holes. It is entirely relieved of belt strain and is counter-balanced by a weight inside of the



frame, making it extremely sensitive and uniform to the touch. It is also provided with means for taking up wear. On the countershaft, which is attached to the frame, are mounted the cone pulley D and the loose pulley E. The belt leads from the cone D over the guide pulleys A to the spindle cone B. The drill can be run at high speed, as the pulleys are turned both inside and out, and the rotary parts are carefully balanced. The spindle pulley is so arranged that it will not throw oil in the operator's face. The drill is designed to be mounted upon a bench or upon a column. The general dimensions are: Greatest distance from spindle to table, 7½ inches; vertical movement of spindle, 2½ inches; vertical movement of table, 7 inches; diameter of table, 8 inches; distance from center of spindle to frame, 5½ inches; weight without column, 45 pounds; weight with column, 110 pounds.

### The New Continental Wire Mill.

The Continental Wire Mills of St. Louis, Mo., will resume operations about August 1 in a large new plant at Granite City, Ill., the old plant having closed down during the recent approach to a coal famine, in order also that work on the new factory might be pushed.

The new works occupy an entire block, containing about 6 acres, admirably situated for shipping facilities on ground 6 feet above the high water mark of 1844. There will be four buildings, the main factory building for the manufacture of barb wire being 300 x 150 feet; the warehouse 150 x 50 feet; the paint house 60 x 30 feet, and the reel house 60 x 30 feet.

The altitude of the structures, which are all of one story, will be 32 feet in the center of the trussed comb roof. Buildings will be made as nearly fire proof as possible. Pilasters 9 x 28 inches will be placed every 20 feet. Twenty-six wooden pillars 10 x 10 inches will support the roof of the manufactory, 13 on each side. These will be sheathed with heavy corrugated iron.

Ample switching facilities have already been arranged and switch tracks are in course of construction connecting with the Belt Line, which will give connection with roads to every point of the compass, and direct connections are also established with the Wabash, Chicago & Alton, Bluff Line, Big Four and C., B. & Q. tracks. Thus perfect communication is had with the roads using the Eads, Merchants', Burlington and Bellefontaine bridges.

The floors of the factory will be built on the level with that of the car on the switch tracks, in order to save labor and facilitate shipments.

D. R. Wolfe says the company will save \$12,000 a year at least on bridge and track charges for the transfer of coal and wire rods across the river.

The latest application of aluminum is made by the shoe trade. It is used as a substitute for leather in building up the heels of boots and shoes.

Reports from all the cotton growing districts of Texas are very hopeful. Both cotton and corn have rarely promised so large a yield. The first bale of cotton of this season's crop was sold last week at Houston. It is claimed to have been the earliest bale ever raised in the United States.

## THE WEEK.

The Columbian International Colonization & Improvement Company have been organized and incorporated under the laws of Louisiana, with a capital stock of \$5,000,000, for the purposes of "building up South American countries"—something of a Herculean task—"and establishing closer trade relations with them." The company have, it is said, as their initial operation purchased several thousand acres of very fertile rolling land in Rio Hacha district, on the Cana River, in the republic of Colombia, which they propose developing into an important trading and agricultural settlement. Piers and a railroad are to be built and a line of steamers chartered. The headquarters of the venture are at New Orleans, from which city most of their capital has been drawn. A number of prominent and influential Louisianians are said to be interested in the scheme.

Reports come from Paris to the effect that the liquidators of the Panama Canal Company have signed an agreement with a new company, capitalized at \$300,000,000, who undertake to complete the canal.

The Bureau of the American Republics announces that the new port of Barrios on the Atlantic coast of Guatemala has been declared open for traffic. Barrios is the northern terminus of a railroad, one third of which is finished, which is designed to stretch across the isthmus to the port of San Jose on the Pacific coast. When the line is completed the time of transit from ocean to ocean by this route will be ten hours.

East bound passenger steamers leaving New York are crowded with both cabin and steerage passengers. Agents of all the transatlantic companies say that this year's passenger traffic to Europe is unusually heavy, and some of the lines are said to be enlarging their carrying capacities in consequence.

According to present indications, the prospects for fair average crops are reported as good in Canada.

Large irrigation works costing \$2,000,000 and irrigating 400,000 acres of land are to be built in the Rio Verde Valley of Arizona. The work is to be completed in 18 months. It includes about 110 miles of canal, and a reservoir of immense capacity.

In a late edition of *Burdett's Official Intelligencer*, a London stock exchange manual, the total par value of the foreign stocks held in Great Britain is estimated at the enormous sum of \$3,819,035,000.

An exhibition is projected at Toronto, Canada, for next year.

The return from Washington to their homes—so far as they possess them—of the members of the various "industrial armies," is taking place with more or less speed. The retreat of the Commonwealers is not always "in good order," and many complaints are made in regard to their presence along the different lines of march.

The Cotton States and International Exposition at Atlanta, Ga., will open September 1 and close December 31, 1895. A bill now pending in Congress making an appropriation of \$200,000 to the exposition has been favorably reported by the House and Senate committees. All of the Southern States are said to be co-operating cordially in the

scheme, with a view of making it a striking exhibition of the industrial and general progress of their section of the Union. The exposition will not, however, be confined to the South, but will embrace the whole country, and will include exhibits from Mexico, Central and South America.

The Manhattan Elevated Railroad Company are experimenting with different electric motors with the view of using electricity for traction in place of steam. They will probably await the outcome of the Chicago Elevated's experiments in this direction before finally deciding on the change.

The Brotherhood of Locomotive Engineers will not join the strike ordered by the American Railroad Union. Chief Arthur, of the Brotherhood, has telegraphed the following laconic message to the engineers: "Stick to your engines." Grand Chief Sargent of the Brotherhood of Locomotive Firemen has also issued a statement intimating that his organization can take no part in the Pullman boycott, as the laws of the Brotherhood do not allow it, and he, as its chief executive officer, has no authority to order a sympathetic strike. He further warns Brotherhood firemen who join the strike that they must look to the A. R. U. for relief and not to the Brotherhood.

Late advices received from Madrid by the State Department indicate that the proposed increase in the Cuban tariff is unlikely to take effect before July 20. It is, moreover, considered extremely doubtful at the Spanish capital that Spain will abolish the existing reciprocity arrangement with the United States for several months, if indeed the whole matter is not dropped altogether.

The official report, just issued, on the foreign trade of Germany in the year 1893 shows a decline in imports of \$23,250,000, as compared with those of 1892; the most important decreases being in wheat, wool and cattle. Exports, on the other hand, increased during the year by \$23,500,000, leaving a balance of about \$250,000 in favor of Germany. Iron and iron goods are among the articles which show the greatest gain, the increase over 1892 being about \$4,750,000 in value.

The report of the Ebbw Vale Steel, Iron & Coal Company shows a gross profit for the year ending March 31 of £96,648. 19/8, making with the amount brought forward for the previous year £177,704. 18/10. After paying interest on debentures and all other expenses, and writing off £32,028 for depreciation, there remains a balance of £128,613, of which the directors recommend a dividend of 2½ per cent., set aside £60,000 as reserve, and carry forward £31,376. The last dividend paid by the company was 1½ per cent. in 1889. Dividends of 1½ per cent. were paid in 1882-83. This present dividend makes only the fourth which has been paid since 1875.

A strange fatality occurred last week at the Norfolk Navy Yard, where two men are reported to have been instantly killed and a number of others were rendered senseless by an electrical discharge while working on the steel cruiser "Raleigh" during a thunderstorm. The workmen were sheltered under the bottom of the vessel, as she lay on blocks in the dry dock.



# The Iron Age

New York, Thursday, July 5, 1894.

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RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## The Western Iron Trade.

The beginning of the second half of 1894 finds the Western iron trade in a condition of uncertainty almost as great as at any time since the spring of 1893. Great consuming interests are in a state of partial paralysis. Not only is the spirit of enterprise checked, but the necessities of the people have been unusually curtailed, and the consumption of iron and steel is at a low ebb. The situation is well expressed by a merchant of long experience who recently said: "I always thought up to this time that iron was a necessity, but I have now changed my opinion, and regard it as a luxury which people can do without when they feel that they must." He spoke after an experience of months of discouragement in endeavoring to sell to establishments that had been for years purchasers of iron and steel in annually increasing quantities. An occasional carload in these times more than meets their requirements. Manufacturing for stock is almost out of the question. While everybody hopes that bottom has been touched, and that changes hereafter will be in the direction of higher prices, yet a downward tendency has ruled so long that every one takes counsel from his fears, and risks as little as possible on the chances of the future.

It is true that in the matter of foundry pig iron the past month witnessed decided activity in the Chicago market, but this cannot be taken as an evidence of general improvement in business. With stove foundries running light, architectural works doing very little, malleable foundries falling far behind their records of previous years, car works idle or but partly employed, and even specialty shops feeling the effect of the depression in business, something stronger is needed than pig iron sales for future delivery to restore the old appearance of prosperity to the trade. Pig iron prices are so low that consumers are positive that they are making no mistake in anticipating their requirements for the remainder of the year or further if possible. As it seems improbable that furnace cost sheets will admit of any reduction on existing figures, those who are buying are taking little or no risk of a decline, and have some reason to expect that they are getting bargains which will prove of value before the contracts expire. Some movement toward placing season contracts for manufactured iron and steel is also visible, but it is by no means equal to

what is usually done in this line, and numerous buyers are disposed to defer negotiations until later in the year, when they hope to do better and at all events think they will be able to do as well as at this time. Mill owners are also professing indifference, pending the settlement of the wages question.

Under the circumstances it will not be surprising if the usual July shut down for repairs should be almost universal, aside from the rail mills, which must run to make deliveries. Some of the mills have, in fact, anticipated the July shut down by a week or two, although not suffering for lack of fuel. In previous years merchants and consumers made some preparation for this cessation of production, in order to have stock enough to supply their wants until the mills started up again. This year there has been no special flurry, but everybody seemed well enough prepared in the ordinary course of business. Midsummer dullness is probably expected to rule all round. Hopes are entertained of a larger volume of business in the fall. Nobody knows how it is to come, nor can any specially good reasons be assigned for expecting it, but, nevertheless, much sanguine talk is heard.

The tariff problem should certainly be solved by the beginning of August, and perhaps with that disturbing element out of the way manufacturers and merchants may feel so relieved that they will begin to stock up to some extent. Then, with fair crops, railroad earnings will improve, and one good influence will assist another, unless perchance the strike fever has not then fully run its course.

## The Folly of the Unions.

Condemnation of the course of the officials of the American Railway Union in boycotting a large number of great railroad systems is almost universal. In itself the wanton interference with the convenience of the public and the business of the country on a pitiable pretext is calculated to arouse antagonism. No one knows better than his competitors that Mr. Pullman has sacrificed everything to keep his works going. The price which he bid on the contract for a small number of cars for the Long Island Railroad some months since staggered even the buyers.

No manufacturer will pretend that he goes on losing money by accepting business at a loss for the sole purpose of keeping his men employed. There are a number of other considerations which are influential in making him maintain that policy. This admission should be frankly made, but it does not weaken the truth of the statement that with the majority of employers the desire to put bread into the mouths of their workmen is a very important factor in urging them to secure business at a temporary loss. We may add right here that such a course is less likely to be adopted in works controlled by unions than in others, simply

because it is less dangerous to allow the working force to scatter.

Whatever the merits of the controversy between the Pullman company and the employees may be, the latter have the undoubted right to decline to join in the effort of the former to capture trade at a sacrifice. The men have a right to decide whether they would rather not work at all than labor for wages which they deem inadequate.

The right of the American Railway Union to jump to their aid by boycotting third parties is more debatable. But that on which all unprejudiced and therefore more clear seeing outsiders are thoroughly agreed is the senseless folly of such a course. There is always a small minority of men who love fighting for fighting's sake. But the vast majority go into a struggle because they want to win. They usually count the cost beforehand, and although such estimates are usually too low, the heat of the contest may justify the additions to self-inflicted injury. There is some grim satisfaction possibly in the conviction that the other contestant, too, is being hurt. It may be magnificent fighting, but is a poor war for all that.

But after all these are incidents. The main issue is whether some end of vast importance can be attained, or whether some vital principle is at stake where justice must be vindicated. The business community is convinced that the issues at stake, be they questions of principle or of fact, do not justify the tremendous machinery which has been brought to bear upon a relatively insignificant service. The attack upon the railroads is generally regarded as a wanton display of irresponsible power, and, what is more, is looked upon as certain of defeat, because conditions are not favorable to the men.

When an industry is prosperous and the employers engaged in it are making money there is some reasonable chance that they can be coerced into sharing their gain. But when that state of affairs does not prevail, as we know that it does not at the present time, strikes and boycotts cannot pay the men who engage in them. The folly of struggling against all-powerful adverse conditions was illustrated in the coal strike. It will again be proven in the boycott started by the American Railway Union.

The new engineering building of the Michigan Mining School, at Superior, Mich., which has been in process of erection since last summer, is rapidly approaching completion. It is expected that the transfer of the engineering appliances from the present building will begin early in July. The new structure will afford a much needed extension of space, which will tend to greatly increase the efficiency of this department of the school.

The President has signed the bill making Labor Day a legal and national holiday.

## CORRESPONDENCE.

### The Nuisance of Irresponsible Brokers.

*To the Editor:* Decadence of the dignity and importance which at one time distinguished the middleman has become more apparent during the past few years of close competition in the iron, steel and hardware trades. Modern brokers whose stock in trade consists of unlimited assurance and a roll top desk have so outnumbered that useful body of gentlemen who formerly conducted negotiations between manufacturer and buyer that they have become a modern nuisance, and serious consideration is being given to quick and sure means for ridding commercial circles of their presence. Not only in America has this incubus troubled the minds of manufacturers and merchants, but in Europe also, and in Great Britain in particular.

As a last resource broken down ironmasters of England, whose lack of careful judgment in economic matters concerning trade and manufacture has reduced them to a state of poverty, have entered the ranks of brokers and have infested the exchanges of Birmingham, Wolverhampton, Middlesboro' and other places hoping to secure business on the strength of their past importance or the pity aroused by their shabby gentility. This class of brokers are usually old or middle aged. They have seen good times and cannot retire from the fields of their palmy days, and can always be found on 'change looking for an opportunity to make a few shillings as a go-between or secure an invitation to dinner. The young man is little known in brokers' circles except as an *attaché* of some responsible house.

In America an entirely different class of brokers exist, made up of smart salesmen, buyers, clerks and others who have adopted the profession either as a supposed source of rapid wealth or because it was the only avenue left open to them in which to earn a livelihood. This product of the times has sprung up in all parts of the country; the manufacturing centers have contributed their quota, and so have important commercial towns. Well-known hardware stores have also representatives in these ranks, and some have arisen from the obscurity of country crossroads. With few exceptions their methods of securing business are of such a character that no respectable industry or branch of commerce appears willing to assume their parentage.

In their methods this class of brokers or commission men have but one object and that is to effect a sale. They serve two masters—the seller and the buyer—and stop at nothing to gain their ends. To the seller or manufacturer they will say that they always endeavor to secure the highest market price, and the buyer is told that his views regarding price will be met, provided he will wait while telegraphic consent is obtained from the seller. In many cases the telegram is never sent; the irresponsible broker takes the order at the buyer's price and asks the seller to accept for the reason that somebody else named an equally low figure. This the seller believes, and he protects his middleman. The buyer profiting by the transaction turns down the letter head and shows the price to the next seller or representative who comes along. Thus the commission man, with nothing in the world at stake besides a common living, has done his daily work of assisting in demoralizing a market.

Apart from this important trouble there are many other business troubles for which the 50 cents per ton broker is responsible. Usually he knows little or nothing about practical manufacturing, and will make all sorts of promises about quality, finish and delivery, taking chances on the ability of the mill or factory to fill the requirements. He gets his commission and cares not who suffers for his actions.

Another branch of the brokers' industry is the purchasing agency. Encouraged by the success of one or two well-known concerns, several minor institutions have come into existence. One of them, located in an obscure country town, has a practice of securing prices on several carloads of material by means of a carefully worded inquiry, and afterward sends postal cards naming this price to small buyers whose purchases never exceed \$50 at a time; and the manufacturer, who in an unguarded moment named the price, does not realize the mischief that is done until the quotation becomes common talk of the trade. This is particularly annoying when the prices named are f.o.b. a certain point of shipment where only one industry in that particular line exists and the identity of the manufacturer cannot be mistaken. It is often the case that the quotations are sent to the manufacturer's direct customers, to whom he has always named prices in accordance with the extent and nature of their requirements—a point to which the purchasing agency who secured the carload price pays no attention. The manufacturer may refuse to fill the small orders, but cannot undo the mischief.

It is time to call a halt on these classes of brokers and leave the field open to direct representatives and the respectable, dignified brokers whose legitimate business methods are not so demoralizing in their effect. The broker of loud mouth, who seems to take pleasure in finding out a hard pressed manufacturer who is willing to cut the price, should be relegated to his position in the store or factory, and better business methods be allowed to rule.

It is encouraging to know that a feeling of antagonism against this disturbing element is making itself felt. Manufacturers have found direct representation preferable to misrepresentation, and even shrewd buyers who have hitherto rejoiced over the effect of dealing with men who were so willing to serve their ends are beginning to feel the annoyance consequent upon agreements made by the commission man not being authorized by the seller. United action of buyers and sellers should soon bring about a more desirable state of affairs.

MANUFACTURER.

**Electric Coal Mining in Kansas.**—An electric coal mining plant has been established at Boicourt, Kan., in the colliery of the Bradley-Vernon Coal Company. Two electrically operated coal cutters are at present employed, each machine having a capacity to undercut 30 inches of coal 400 lineal feet in a day. Current is supplied to the motors on the coal cutters by an 85 horse power 220 volt generator, which is of sufficient capacity to operate four cutting machines of the size in use. The plant has thus far given very satisfactory service. The electrical machinery is of the standard type of mining equipment made by the General Electric Company, the sale having been made by the Chicago office of that company.

## OBITUARY.

BENJAMIN DOUGLAS.

Benjamin Douglas died on Tuesday night, June 26, 1894, at Middletown, Conn. M. Douglas was born at Northford, Conn., April 3, 1816, of Scotch ancestry. He acquired the rudiments of his education by a few months' attendance at the district school during the winter while a lad and by extensive reading since then. When 16 years of age, in 1832, he came to Middletown and apprenticed himself to a machinist. In 1839 he joined his brother William, who in 1832 had with W. H. Guild established a machine shop. For three years they carried on the business of an ordinary foundry and machine shop, manufacturing hydraulic rams and pumps. From the invention in 1842 of the celebrated revolving stand pump the success of this firm was established. Year after year the business increased until the name of W. & B. Douglas was known the whole world over. They have an extensive trade throughout the world. William Douglas died April 21, 1858. He was Mayor of Middletown from 1849 to 1855, a member of the General Assembly in 1854, a Presidential elector in 1860, and Lieutenant Governor in 1861. Mr. Douglas was a director in the Middletown Gas Company and the Air Line Railroad, and a director and large stockholder in the People's Fire Insurance Company. He was the first president of the First National Bank and continued to hold that office until Hon. John N. Camp was elected, and then he remained as a director until the present time. He was also for years president of the Farmers and Mechanics' Savings Bank.

BERNARD LAUTH.

Bernard Lauth died at his home in Howard, Centre County, Pa., on June 25, 1894, in his seventy-fourth year. For more than 60 years Mr. Lauth had been identified with the manufacture of iron in this country, and during most of this time he was prominent as an employer and also as an inventor. The *Bulletin of the American Iron and Steel Association* tells the story of his life as follows:

Bernard Lauth was born on August 23, 1820, in Alsace-Lorraine, and came to this country with his parents and grandparents in the spring of 1831. He was put to work in Shoenberger's rolling mill at Pittsburgh, where he remained seven years, after which he was put in charge of a train of rolls at Hoke & Hartman's works at Pittsburgh. He remained at these works until 1844. In the year 1848 he joined hands with some other workmen and they built a merchant mill at Zanesville, Ohio. He sold his interest there in 1852 and returned to Pittsburgh and in company with a brother started in an orchard the American Iron Works, now owned by Jones & Laughlins. In 1858 he made his first invention, cold rolled shafting, and in the winter of that year sailed for Europe to introduce it. He worked hard for seven years, but strange to say there is not a single works in Europe to day that rolls cold rolled shafting. They have there a system which they term cold rolling, but it is not, as the bars are finished hot. In 1862 Mr. Lauth made his three-high plate roll invention and also his straightening machine for bars and angles.

When he made his invention of cold rolled shafting he experimented a great

deal on thin sheet iron and was anxious to reach some method by which he could secure a reduction in the thickness of thin sheets and a finer finish for their surface. He knew that he could do this if he could use rolls with a small diameter, but if he attempted to reduce the rolls they would spring and break. One night he and his oldest son, B. C. Lauth, were traveling from Paris to Strasburg, when the thought occurred to him that he could place a small roll between two large rolls and get the effect of the small roll and prevent its breaking by the support of the larger rolls. This was the end of the chapter, and his son received a thump and a shake to awake him and was informed that he "had it." "Have what?" asked the son. "Why, I can roll single sheets and put a face on them like a looking glass; that's what I want for Russia sheet iron." He then explained his invention in detail.

A short time afterward he went to the works of M. DeWendel, at Hayange, near Metz, and explained his new mode, and suggested to M. DeWendel that it would be a great improvement for cold rolling tin plate. That gentleman said he would submit the plan to his engineers, which he did, and after a thorough investigation by five of them it was pronounced impracticable. They claimed that the small roll would break. This was a little more than Bernard Lauth could stand, and he said some hard words and begged to differ with them, stating that, with all due appreciation of their very learned technical knowledge, he was sorry to say that they did not know anything about rolling. He then turned to M. DeWendel and said: "I will build this mill at my own expense if you will pay me a certain sum of money if it accomplishes what I claim." This offer was accepted, and the mill was started and did more than was claimed for it.

After seven years of hard work and the using up of nearly all his means Mr. Lauth returned to the United States and organized the Reading Sheet Mill Company, where the three-high rolls were put up and proved their great efficiency. He also put in the universal rolls, they being the first that were erected in this country. Anthony Klotman came to Reading and saw them at work and then introduced them into his mill at Pittsburgh.

The next patent that Mr. Lauth obtained was for a continuous mill for rolling hoops and strips. This invention is now in very successful operation.

In 1871 Mr. Lauth purchased the Howard Iron Works, at Howard, Pa., which he operated for a number of years and then sold them, their present owners being Jenkins Brothers & Lingle, since which time he has enjoyed the leisure which of right belongs to old age.

Relatively the quantity of foreign iron and steel remaining in warehouse has been large lately. The Treasury Department furnishes the following figures for the quantities on May 31, 1894, and May 31, 1893:

*Iron and Steel in Bonded Warehouse.*

	May 31, 1894.	May 31, 1893.
Iron ore, tons.....	45,775	.....
Pig iron, tons.....	2,636	791
Scrap, tons.....	1,203	978
Bar iron, pounds.....	6,607,501	3,450,392
Steel rails, tons.....	3,180	2,859
Ingot and billets, pounds.....	2,374,279	1,144,100
Sheets and taggers, pounds.....	5,124,898	11,908,854
Tin plate, pounds.....	51,317,315	29,593,134
Wire rods, pounds.....	6,719,530	5,134,836
Wire rope, pounds....	765,715	288,214

The bulk of the iron ore, of course, is at Sparrow's Point. The bar iron is Swedish, while a part of the rails are known to be for the Canadian Northwest. Tin plates are, of course, left in bond as long as possible, on the chance of a lowering of duties.

### The Status of the Coal Miners' Strike in Alabama.

To state correctly and impartially the true facts and present the status of the differences between the miners and operators in Alabama is a very difficult and not very pleasant task. Both were right and both were wrong. The miners being under contract up to July 1, were about the only class of labor whose wages had not been affected by the stringency of the times, whereas all other classes of labor had been heavily reduced, common labor down to 75 and 80 cents per day. True the miners had not had regular work and their average daily wages were consequently small, but neither was there any other class of labor that had worked more regularly than the miners. The depression had affected all alike in irregularity of work, but not in reduction of wages. So far the miners had had all the advantage.

Meanwhile coal and coke in the Connellsville regions had gone to very low figures, and Alabama iron men were at a serious disadvantage in the keen competition with the Pennsylvania and Ohio furnaces. While Connellsville coke was quoted at 90 cents and lower Alabama coke was \$1.65 to \$1.90 per ton. Coupled with this was the still decided superiority of the Pennsylvania coke for furnace uses. It was then that the operators sought relief by following the Northern precedent of attempting to reduce wages. A cut of about 10 per cent. was proposed and first refused by the miners, who claimed the contract to July 1, as they had a right to do.

Now comes a point where authorities differ. It is held that, had the operators been a trifle more patient, the miners would have ultimately agreed to a cut of 10 or 12 per cent., in view of the times and the promise that more furnaces would go into blast on account of freight reductions. As it was the operators offered a cut of 20 to 25 per cent., and threatened to run the mines by contract and negro labor if the miners did not comply. Many believe to this day that cooler heads and the exercise of a more patient spirit would have averted the strike, at least not engendered the bitterness now existent.

The action of some of the operators was quick, sharp and energetic in the extreme, just of such a nature as to arouse the sense of opposition in the miners to the utmost. The determination was announced to hereafter use negro labor in the mines in preference to the white labor. Whether it is a matter of real economy to run on negro labor for this class of work is doubted by many, as the negro miner lacks many of the qualities possessed by a good white miner. However, the future will determine this. The result of this move on the part of the operators was as could be expected. The miners, or a portion of them, at once resorted to violent and threatening measures. Deputies were required at all the mines; the convict stockades had to be heavily guarded, and the Sheriff, in the prompt and honorable discharge of his duty, was threatened and insulted almost beyond human endurance, but refrained from retaliation with admirable patience and courage. Various deeds of violence

continued and finally Governor Jones, after patient and repeated efforts and interviews with the miners' committee, decided to have the annual encampment of the Alabama State troops held at Ensley City, where the troops would be centrally located in case of any trouble at the various mines. That this movement was a most wise and fortunate one is now beyond doubt. It prevented the destruction of lives and property and held the fiery element of the mining communities in check as nothing else could.

An effort was made by the miners to interest the railroad man in their cause, but without effect, and then began a series of bridge burnings and dynamiting for which no one can ever offer the slightest excuse. The lives of the railroad men, of innocent women and children were threatened and several disastrous wrecks caused on the various roads. That these deeds were committed by disaffected miners is without the least question of a doubt and is also evidenced by the imprisonment of so many miners for these offenses. And so far the miners' committee has taken no active step in any way to stop these actions, or properly denounce them in public.

Another mistake made by the miners has been the calling out and interfering with men at mines that had no quarrel with their operators, who paid the wages demanded, and complied with the conditions in a manner satisfactory to their men. While this may have been in line with their general policy, yet it took away from them public sympathy in a great measure, as this action entailed loss and privation to both operators and men who were working in harmony with each other, and tended to discourage operators from doing justice to their men, as well as embitter the relations between them and their employees.

On the other hand, the miners had and have grievances which they are justified in demanding remedied. The check weighman system is one. When a man is paid by the ton he has a right to demand a ton, and to know that he is getting it. If weights are to govern the wages, they should be correct, or some other method adopted, such as paying by the car.

It is true that the commissary system had its faults and shortcomings; that marked hardships to the men exist is also undeniable. While the officers of the companies may desire that perfect justice be done and equitable prices be charged, the difficulty lies in controlling the prices actually charged by the storekeepers, which frequently vary so materially from what would be fair market prices, and what the officials may desire to be charged, that they become the cause of serious disaffection among the men. This is a delicate matter, as it is difficult of proof, and can only be asserted as a fact by those who have been interested in and had dealings with these commissaries. It is by no means contended that the commissary system is a bad one; on the contrary, it is at most mines an absolute necessity, owing to the improvident nature of a great proportion of mine labor, who can never have credit, and would suffer if they had to wait for their pay even from week to week. A commissary kept with a view to legitimate business is a blessing to the employees, if the company is cautious in its selection of storekeeper; otherwise, through the greed of a few, the goose that lays so many golden eggs for the company will surely be killed. It may be objected that there always will be

differences between labor and capital. This is true, but in a majority of cases patience, calmness and fair dealing, on the side that has the better education, the greater intelligence and the greater ability to take care of itself in times of need would avert much of the bitterness and hardship attendant on these struggles.

## CORRESPONDENCE.

### Unjust Freight Discrimination.

To the Editor: In your issue of June 28 you have an interesting editorial on "Unjust Freight Discriminations," limited, however, to a discussion of the freight rates to Southern points from places between New York and Pittsburgh on the Pennsylvania road.

You criticize the fact that it costs more by \$2 per ton to ship iron and steel manufactures from Pittsburgh than from Johnstown to Southern points although Johnstown and Pittsburgh are only 78 miles apart.

The grievance arises from the use of the block system, and the case is not fully stated until you add the fact that the freight from Pittsburgh to Southern points is only \$2 more than from New York, although these two cities are 444 miles apart. The difference, which is excessive at one end (Johnstown) of the block, is very low at the other end (New York).

No city in the United States has less cause to complain of the operation of the block system on the Pennsylvania Railroad than has Pittsburgh. Under its operation the iron manufactures of Pittsburgh are distributed to all points east of New York at a rate only 4 cents per 100 pounds higher than the rates from Philadelphia; or, in other words, they are carried from Pittsburgh to Philadelphia, 354 miles, for 89½ cents per gross ton, when they go through Philadelphia, to compete with the products of that city, in her Eastern markets. But if the manufacturers of Philadelphia wish to buy crude materials (pig iron, steel billets) at Pittsburgh, for use in Philadelphia, the rate immediately becomes \$2.10 to \$2.30 per gross ton.

The block system and its attendant discriminating rates are an injury and a serious menace to Eastern Pennsylvania; but if, for once, at the points which you indicate, the block system works to the advantage of Eastern mills and to the disadvantage of Pittsburgh, this condition will doubtless be changed, for the whole policy of the Pennsylvania road is designed to advance the interests of the Pittsburgh district at the expense of Eastern Pennsylvania. The block system should be wiped out and a mileage system adopted.

PRODUCER.

JULY 2, 1894.

Experiments are being made by Captain Schley, United States Navy, Light-house Inspector at the Tompkinsville, Staten Island, lighthouse, in New York harbor, with the new light destined to replace the present beacon on Fire Island. It is believed that the new light will have no equal in the world. It is the famous Le Paute lens, exhibited at the World's Fair and bought by the Government for \$10,000. The strength of the light will be 250,000,000 candle power, which is 50,000,000 greater than the powerful search light lately placed at Sandy Hook.

### Discrimination Against Pittsburgh.

In our issue of last week appeared a statement giving the rates of freight on articles of iron and steel manufacture in carload lots from Boston, Providence, New York, Philadelphia and points west of Philadelphia as far as Latrobe, Pa., as compared with rates from Pittsburgh to Southern points of shipment. Since the appearance of the article in question, the Southern Railway and Steamship Association has issued a new tariff, making the rates from Eastern points of shipment lower than those published last week. According to this tariff rates on articles of iron and steel manufacture in carload lots are as follow:

From Philadelphia to—	Per 100 lb.	From Boston, Mass., Providence, R. I., New York City, N. Y. Per 100 lb.	From Pittsburgh, Pa. Per 100 lb.
	Cents	Cents	Cents
Albany, Ga. . . . .	17	17	23
Americus, Ga. . . . .	17	17	23
Anniston, Ala. . . . .	17	17	23
Athens, Ga. . . . .	17	17	23
Atlanta, Ga. . . . .	17	17	23
Augusta, Ga. . . . .	13	13	19
Birmingham, Ala. . . . .	15	17	23
Chattanooga, Tenn. . . . .	15	17	23
Columbus, Ga. . . . .	17	17	23
Huntsville, Ala. . . . .	15	17	23
Knoxville, Tenn. . . . .	14	14	20
Macon, Ga. . . . .	17	17	23
Mobile, Ala. . . . .	15	17	23
Montgomery, Ala. . . . .	15	17	23
Nashville, Tenn. . . . .	9	11	20
Rome, Ga. . . . .	17	17	23
Selma, Ala. . . . .	15	17	23
Woodward, Ala. . . . .	15	17	23

The fact that the New York basis of rates that were in force on the line of the Pennsylvania Railroad west of Harrisburg as far as Latrobe, Pa., has been withdrawn will prove of little benefit to Pittsburgh manufacturers so long as the mills east of Harrisburg and in the seaboard cities have such a decided advantage over Pittsburgh in their ability to reach the Southern market at rates very much lower than apply from Pittsburgh. The fact that Pittsburgh is located considerably nearer to most Southern cities than New York, Boston or Providence, and with her immense tonnage, greater than that from any other city in the United States, makes the discrimination in favor of Eastern competitors a question of very serious import to Pittsburgh manufacturers, and one that should be taken up and contested until the necessary relief is given. The low rates from Boston, Providence, New York and Philadelphia to the South apply not only by rail and steam, but all rail as well. The published rates from the Southern gateways—viz.: Baltimore; Alexandria, Va.; Hagerstown, Md.; Strasburg, Va., and Richmond, Va.—through which the railroads reach the South, is 14 cents to nearly all points of shipment, and as the through rate from Boston, Providence, New York and Philadelphia to most of the Southern cities is 17 cents all rail or rail and water, this would give the railroads about 4 cents per 100 pounds as their proportion of the through rate from the Eastern cities to the gateways, while Pittsburgh is charged 10 cents per 100 pounds to reach the above named gateways, and 12 cents per 100 pounds to the nearest Ohio River crossing.

A suit against the Harney Peak Tin Mining Company, involving a large amount of money and based upon grave

charges of fraud, has been commenced in the United States Circuit Court in New York by English stockholders in the concern. Judge Lacombe has appointed Albert R. Ladoux temporary receiver for the Harney Peak Company, with an order requiring the defendants in the suit to show cause why the temporary receivership should not be made permanent.

### PERSONAL.

Henry R. Towne of the Yale & Towne Mfg. Company sailed for Europe last week.

Charles M. Rolker, mining engineer, has established an office at 20 Nassau street, New York, after an absence of several years, some of which were spent in Mashonaland, South Africa.

Brown University has conferred upon E. L. Corshell, the well-known bridge engineer, the degree of Doctor of Science.

James A. Burden of Troy, N. Y., has gone abroad.

Jerome Wheelock sailed on the French steamer on Saturday.

H. M. Montgomery has severed his connection with Babcock & Wilcox and has entered the employ of the Goubert Mfg. Company, manufacturers of feed water heaters and Stratton separators.

The resignation of T. H. Aldrich, general manager of Tennessee Coal & Iron Company, took effect July 1. His conservatism in business affairs and his high character for personal integrity and fair dealing with his men will make his loss seriously felt by the company and the Birmingham district.

W. C. Temple, whose withdrawal from Babcock & Wilcox was noted recently, has been admitted to partnership in the well-known Pittsburgh firm of H. E. Collins & Co., iron and steel merchants.

Nine hundred men were laid off work at the Brooklyn Navy Yard on Monday in consequence of the decision of Attorney-General Olney that the resolution extending the naval appropriations for one month, which had passed both Houses of Congress and received the President's signature, does not include the work being done under "increase of the navy." The vessels affected by the stoppage of work are the turret ships "Puritan" and "Terror," the gunboats "Castine" and "Machias" and the armored cruiser "Maine." This unexpected loss of employment is a great disappointment to the mechanics and laborers, who had confidently expected an uninterrupted season of work during the summer. Workmen in the other Government yards shared a similar experience.

The records of the Bureau of Navigation show that during the first three-quarters of the present fiscal year there were built in the United States and officially numbered 339 wooden sailing vessels, of 24,271 tons, and 221 wooden steam vessels, of 29,948 tons. During the same period 3 iron or steel sailing vessels were built, of 4,749 tons, and 27 iron or steel steam vessels, of 26,920 tons. The sailing vessels aggregated 342 in number and 29,021 tons in measurement. The steam vessels aggregated 248 in number and 56,869 tons. The entire number of vessels built and numbered was 590, the tonnage being 85,890.



## MANUFACTURING.

### Iron and Steel.

There are no new developments in the trouble between the National Tube Works Company, McKeesport, Pa., and their employees, and the entire plant of that concern remains idle. No overtures toward a settlement are being made by either side and in all probability the plant will be idle for a considerable time yet.

The Carrie Furnace Company of Pittsburgh will probably blow in No. 2 stack, at Rankin, Pa., during the present week. This stack has been idle for some time, owing to the coke strike, but No. 1 stack has been in operation for about a month.

Nearly all the idle iron mills in the Mahoning Valley, Ohio, resumed operations to some extent last week, a partial supply of coal having been secured. The Brown-Bonnell Iron Company started up nearly all departments of their plant, as did the Mahoning Valley Iron Company and the Union Iron & Steel Company.

At Ironton, Ohio, the plants of the Belfont Iron Works Company, Kelly Nail & Iron Company and Eagle Iron & Steel Company are in operation to nearly full capacity.

The Aschman Steel Casting Company, Sharon, Pa., manufacturers of open hearth steel castings of every description, whose plant was recently destroyed by fire, have since been in receipt of offers of free land and free gas to remove to Indiana. Offers have also been made the concern to locate in Youngstown, Ohio, and at other points. As yet no decision has been arrived at as to the location of the new plant, but it is not improbable that it will be removed from Sharon.

The Pittsburgh Tin Plate Works, New Kensington, Pa., about 20 miles from Pittsburgh, have given a contract to the A. Harrison Foundry Company of Pittsburgh for the erection of a two-mill plant, and when completed will roll their own sheets for tinning purposes instead of buying them, as heretofore. The new addition will be so constructed that two additional mills can be added at any time desired.

The Laughlin Nail Company, Wheeling, W. Va., have recently started up their nail factory at Martin's Ferry, Ohio, after an idleness of three months. The nail factory of this firm contains 226 nail machines, and is the largest cut nail factory in the world.

At Pittsburgh last week several conferences were held between a committee of the Amalgamated Association and Jones & Laughlins, Limited, over the steel wage scale, but as yet a scale has not been agreed upon satisfactory to both sides. Owing to the fact that a number of important improvements and additions to equipment are now being made in the converting department by the firm it has been found necessary to make some radical changes in the scale, but it is believed that a settlement will be reached, although it may require several weeks before this is accomplished.

All departments of the Solar Iron Works of Wm. Clark's Son & Company, at Pittsburgh, which shut down on account of the coal strike, are again in full operation.

Press dispatches state that the rolling mill, Burlington, Iowa, owned by Richard Brown and other capitalists of Youngstown, Ohio, has been sold to the Western Iron & Steel Company, organized at Tacoma, Washington, and will be removed to Lake View, a suburb of Tacoma, at an early date.

The annual meeting of the Phoenix Iron Company, Phoenixville, Pa., was held at the company's office, 410 Walnut street, Philadelphia, on June 26. All the directors and officers were re-elected.

Mingo Furnace, of the Junction Iron Company, Mingo Junction, has blown in.

The Penn Company, Limited, Lancaster, Pa., manufacturers of merchant bar iron and railroad equipment, whose plant has been idle for the past two months on account of the coal strike, have again started up in all departments. This concern owns large coal mines in Clearfield County, Pa., on which they depend for their supply of coal, and these have also been started up since the settlement of the coal strike.

It is reported that the Hubbard Co-operative Iron Company, Hubbard, Ohio, organized by former employees of the Mahoning Valley Iron Company will go out of business on account of the depression in the iron trade.

The Ironton Structural Steel Company of Duluth, Minn., have made arrangements, through James E. York, general manager, for additional capital and will at once proceed to build needed machinery to put their works on a proper commercial basis. Large contracts are in view for 36-inch beams, which the mill is to be arranged to roll.

The Andrews Brothers Company, operating the Haselton Iron Works, Haselton, Ohio, have just completed annual repairs and are again in operation in all departments, and are prepared to make prompt shipments of bars, bands and iron and steel sheets. Haselton furnace of this concern, which has been idle for some time on account of the coke strike, will be blown in as early in July as a sufficient supply of coke can be secured.

A meeting of the creditors of the Eastern Forge Company, Deering, Maine, has been held in Boston. The assignees of the company, William N. Fisher of Gloucester and George F. Morse of Portland, presented a statement showing liabilities of \$121,685; assets, total, \$246,786; secured and preferred, \$67,630. It was voted that the unsecured creditors be paid 50 per cent. out of the quick assets and accept the balance in preferred stock, provided that the stockholders contribute \$10 per share for carrying on the business and the secured creditors waive their claims to interest. A Conference Committee to advise with the assignees was chosen, consisting of Mr. Weightman of the Carnegie Company, Mr. Mellin of the Boston Bridge Works, and J. H. Hill.

Richard Greiner has been appointed by Judge Herter receiver for the New Albany Forge & Rolling Mill, New Albany, Ind., in place of E. M. Hubbard, resigned.

Plumb, Burdick & Barnard, nut and bolt manufacturers, are pushing work on their new plant at Gratiwick, N. Y. The first building is under roof. Another will be built this year. These two will be respectively 300 x 85 and 400 x 60 feet. Two other buildings of large dimensions will be constructed next year, completing the plant.

At the annual meeting of the Bethlehem Iron Company of South Bethlehem, Pa., the following directors were elected: R. H. Sayre, Joseph Wharton, E. P. Wilbur, R. P. Linderman, George H. Meyers, Beauveau Borie and E. P. Leisenring. The directors organized afterward by the election of the old officers: R. P. Linderman, president; T. S. Schropp, secretary; C. O. Brunner, treasurer.

The Sunbury Iron Works of Sunbury, Pa., have been purchased by Irving E. Zeigler and H. C. Sypher of Philadelphia.

The rolling mill at Rome, Ga., has been leased to W. F. Nevigold.

Bristol Furnace, at Bristol, Va., will not be sold.

The Portage Iron Company of Duncansville have started. The puddling mill is idle because the men decline to work at \$2.75 per ton for puddling.

Citizens of Tonawanda, N. Y., are trying to secure the building of a Bessemer plant in that locality. Crown & Campbell have the matter in charge.

Kutztown Furnace, at Kutztown, Pa., is being dismantled.

The Burlington Rolling Mill, at Burlington, Iowa, owned by Youngstown capitalists, has been sold to a syndicate known as the Western Iron & Steel Company, and will be removed to Lakeview, a suburb of Tacoma, Wash., which gave a large bonus to secure it. P. M. Joyce, formerly with the Mahoning Valley Iron Company, will have charge of the erection and construction of the mill.

### Machinery.

The Frank-Kneeland Machine Company, Pittsburgh, Pa., manufacturers of rolls and rolling mill machinery of all kinds, have recently shipped two hot and two cold tin mills to the Canonsburg Iron & Steel Company, Canonsburg, Pa., also a set of cold rolls to the Reeves Iron Company, Canal Dover, Ohio. The same firm have the contract for the doubling and squaring shears for the new two-mill plant now being erected by the Pittsburgh Tin Plate Works, at New Kensington, Pa.

The Union Foundry & Machine Company of Pittsburgh recently made a shipment of two gears for the new tin plate works of the Britton Rolling Mill Company, at Cleveland, Ohio. These gears are  $7\frac{1}{2}$  feet in diameter, with 16-inch face, and weigh about 5 tons each. The same firm have an order from

the American Tin Plate Company of Ellwood, Ind., for a gear wheel which will measure 16 feet in diameter, 20-inch face, and pinion 6 feet in diameter to match, and 30-ton fly wheel.

The Daniels Steel Railroad Tie Company, Youngstown, Ohio, have received a contract for several thousand steel ties to be furnished the Terre Haute Street Railway Company, Terre Haute, Ind.

The Toledo Machine & Tool Company, Toledo, Ohio, manufacturers of presses, dies and sheet metal tools in general, are running their plant extra time in order to get out as fast as possible some large orders which the firm have on hand. At present this concern are just completing some large sized presses, among which is a special machine with automatic feed attachment for making links for steel chain belting. The machine will weigh about 10,000 pounds, and will have a capacity for making about 40 links per minute where one link is made at a time. It is also so arranged that two links smaller in size can be made at one operation. They are also putting on the market a new power lock forming, or edging machine, for which a number of valuable features are claimed. In addition to these they have recently brought out a new bail forming machine for forming up bails for tin pails, buckets, &c. The new riveting machine, especially adapted for the manufacture of tinware, put on the market by this concern some time ago, is reported as giving satisfaction.

The Enterprise Mfg. Company, Columbiana, Ohio, are making the necessary arrangements looking to the manufacture of boilers in connection with their present business, which consists in the manufacture of portable saw mill engines and street paving rollers. Since this firm commenced the manufacture of steam road rollers they have found it necessary that they should make their own boilers. A new design of road roller has recently been put on the market by this firm, for which some exceptional features are claimed.

Thomas Carlin's Sons, founders and machinists, Allegheny, Pa., recently received an order for the construction of a steel derrick with mast 90 feet high and boom 87 feet, the crane to have a capacity for lifting 20 tons. This firm have just shipped a complete outfit, consisting of four 60-foot and one 30-foot steel derricks to the new dam now being erected by the United States Government at Herr's Island, near Pittsburgh. Included in this order are a number of hoisting engines, centrifugal pumps and engine to drive same. This firm have quite a number of orders on hand and are operating the various departments of their plant to nearly full capacity.

The Marion Tool Company, Marion, Ohio, have been granted a charter of incorporation, with a capital stock of \$10,000. The new concern will engage in the manufacture of tools, implements and machinery.

The Board of Directors of the Union Switch & Signal Company of Pittsburgh have declared the regular quarterly dividend of  $1\frac{1}{2}$  per cent.

The Harrison Safety Boiler Works, Germantown Junction, Philadelphia, manufacturers of the Cochrane separator, are supplying a 7-inch and a 12-inch separator for the New Delaware Avenue Power Station of the Electric Traction Company of Philadelphia for use in the steam mains leading to their large engines. The separators are of the horizontal type.

At Greensburg, Pa., last week the jury in the case of M. A. Cutter of Allegheny, Pa., against the Nation's Mower & Reaper Company of Latrobe, Pa., returned a verdict in favor of the plaintiff for the company's property, with 6 cents damages and costs, to be released upon the payment of the sum of \$30,000 to the plaintiff within 90 days. About two years ago the plaintiff, in connection with a number of Pittsburgh and Latrobe capitalists, established a mower and reaper works at the last named place, but it is claimed the machinery made proved unsalable and the concern went into the hands of a receiver. Cutter sued to recover his interest in the property, claiming that he was entitled to receive \$120,000. If the stockholders do not pay the \$30,000 within 90 days the plaintiff will come into possession of the entire plant.

It is stated that the output of the Westinghouse Electric & Mfg. Company of Pittsburgh for the month of May amounted to \$550,000 with about the same amount of business secured during that month.

The Totten & Hogg Iron & Steel Foundry Company of Pittsburgh are still running

their plant night and day, and have enough orders on their books still unfinished to keep them running the same way for three or four months longer, their orders all being for tin plate work. They have just shipped to the Cumberland Steel & Tin Plate Company three 24-inch hot mills, to the Irondale Steel & Iron Company three hot mills, with rolls all complete, two doubling shears, and one trimming shear. On the 28th ult. they closed another contract with the same parties for four 24-inch hot mills, with rolls all complete, and a 600 horse-power engine, with double counter shafts and large gears, boilers of sufficient capacity to furnish steam for the engine, four doubling shears and two trimming shears. Last week they closed a contract with the Montpelier Sheet & Tin Plate Company for four 24-inch hot mills and four 20-inch cold rolling mills, with rolls, and one of their new improved 38-inch rollathes.

The Kansas City Car & Foundry Company have been organized to build a car wheel and cable pulley factory at Armourdale, near Kansas City. The bulk of the stock is owned by Wm. McMillan, W. N. McMillan and W. K. Bixby of the Missouri Car & Foundry Company of St. Louis. Work is to begin at once, and it is expected that the plant will be completed in about four months.

The Russell Engine Company, Massillon, Ohio, through their Pittsburgh office, have secured a contract for furnishing a number of cross compound condensing engines to the Second Avenue Traction Company of Pittsburgh, aggregating 1800 horse-power. It is stated that the contract amounts to about \$30,000.

It is stated that the net earnings of the Standard Underground Cable Company of Pittsburgh for 1891 were \$66,000; 1892, \$94,000; 1893, \$127,000, and for the first six months of this year they will approximate \$75,000. At this rate the concern are earning about 10 per cent. on the capital stock, and paying but 6 per cent. in dividends. There is talk of an early extra dividend or an increase in the regular rate. The firm have practically settled their claim, amounting to between \$100,000 and \$200,000, against the United Electric Company, and are without a cent of debt of any kind.

The Rice & Sargent Engine Company have been incorporated at Providence, R. I., for the manufacture and sale of steam engines. The officers are R. A. Robertson, president; Z. Chafee, vice-president; John W. Sargent, secretary, and Richard H. Rice, treasurer. The office is at 40 Codding street, Providence, R. I.

The Harrison Safety Boiler Works of Germantown Junction, Philadelphia, are furnishing to the Girard Life Insurance, Annuity & Trust Company of Philadelphia another improved Wharton Harrison safety boiler of 160 H. P. capacity. The Girard Company have already two of these boilers in use in their building, and the new one is necessitated by the addition of three stories to their present eight-story building.

The F. M. Kennedy Machine Works are enlarging their plant at Findlay, Ohio, by the addition of a building 30 x 100 feet.

The Bethlehem Foundry & Machine Company, South Bethlehem, Pa., are at present busily engaged on patent rotary steam drills and iron work for the new Tasker Pipe Works, and other structural work.

The Malleable Mfg. Company of Dayton, Ohio, were incorporated at Columbus, with \$25,000 capital. The incorporators are: R. T. Houk, T. H. Money, H. Gillespie, J. E. Pierce and Edward T. Hall.

T. C. Ward, president of the Auburn Wagon Company of Greencastle, Pa., has purchased from J. L. Crowell and others the Crowell Machine Shops in Greencastle, Pa.

Frank and William Dodge and L. D. Wilday of Wiscovy have just formed a copartnership under the firm name of Dodge & Co., and will operate the Wiscovy Foundry & Machine Shop.

The pattern room of the foundry of Norton, Parker & Co. of Vineland, N. J., has been destroyed by fire.

P. W. Dietz of Erie, Pa., has begun the building of a new machine shop.

A fire has destroyed a part of the Bridgeford Foundry, at Louisville, Ky.

The car shops of the Buffalo & Susquehanna Railroad are to be built at Galeton Pa.

The brass foundry and pattern shop of T. B. Rohrman of Philadelphia has been damaged by fire.

Seamless drawn copper tubes 16 inches in diameter were furnished by Randolph & Clowes of Waterbury, Conn., for the lake steamship "Northwest," which is to ply between Buffalo and Duluth. There were drawn on a massive hydraulic machine specially designed for the purpose. These seamless tubes have heretofore been made in lengths too short for this use.

Snell & Meharg's large machine works, at Hamburg, Pa., recently destroyed by fire, are now being rebuilt.

#### Hardware.

The Southington Cutlery Company, Southington, Conn., have shut down their works for two weeks, during which time the annual inventory will be taken.

The Marion Tool Company of Marion, Ohio, have been incorporated, with a capital stock of \$10,000. The incorporators are William J. Miles, Jr., Fred. Haberman, Edward Huber, Frank A. Huber, George W. King and A. E. Cheney.

The powder mill of Lafin & Rand Powder Company, 1 mile from Platteville, Wis., containing more than 400 kegs of powder, exploded on the afternoon of the 18th inst. The employees had just left the premises and no one so far as known was hurt. The roof of the mill was carried a quarter of a mile and left in sections in the tops of trees.

The Milwaukee Reel Company have been organized at Milwaukee, Wis. The company's capital is \$4000. The incorporators are J. H. Woodnorth, Herman O. Frank and Arthur S. Tonda.

A new Chicago organization is the Porter Nut Lock Company, who have just been incorporated, with a capital stock of \$50,000, the incorporators being Benjamin Porter, Charles W. Porter and Thomas M. Evans.

The Benbow Mfg. Company, St. Louis, Mo., manufacturers of the Columbian self heating washing machine, report a good demand for these machines. They have just shipped 60 to Los Angeles, Cal., and have recently made extensive shipments to points in the East.

N. H. Prouty, manufacturer of the Prouty wire valve wheel, has removed his business from Charlton City, Mass., to Athol, Mass., and will continue the manufacture of the wheels in a larger way than heretofore.

L. S. Starrett, Athol, Mass., manufacturer of fine mechanical tools, is now occupying his enlarged factory. The additions include a four-story building, 160 x 40, and a power house, 70 x 44. One section of the main factory is trussed across a river, so that the sections on either side are now joined. The remodeled plant is arranged and equipped in a way to utilize all its possibilities. This concern have recently added a line of milling cutters, metal slitting saws and gear cutters.

Sawyer Tool Company, Athol, Mass., have recently commenced the manufacture of fine tools for mechanics. B. E. Sawyer, superintendent and manager of the new concern, has had a number of years' experience in this line of business. At present their leading specialty is a protractor miter, to which will be added a general line of mechanics' fine tools. The concern are now occupying a new building 30 x 50, with three floors.

Ludlow-Saylor Wire Company, St. Louis, Mo., are kept busy in their art metal department. Among the contracts recently secured by them they mention the iron railing for the new \$1,000,000 Union Station in St. Louis. They are also engaged on a number of banking house outfits, some of which are referred to as being very elaborate.

Heimbuecher & Webber, St. Louis, Mo., have been appointed agents for the Priestly Express Wagon & Sleigh Company of Grand Rapids, Mich., who manufacture a full line of extension and step ladders, children's express wagons and hand sleighs, door and window screens, &c. A catalogue showing the complete product of this factory will shortly be issued to the trade.

The Rotary Curling Iron Company have been incorporated at Ottumwa, Iowa, by J. B. Dennis, Guy G. Major and C. W. Major, with a capital stock of \$50,000, to manufacture hair curling and crimping irons.

Adolph Butze, St. Louis, Mo., is sending out circulars to the trade illustrating a line of desks and office furniture of all kinds. The circulars contain illustrations of desks, chairs, letter files, from the cheapest to the most expensive. Mr. Butze is prepared to

make special figures for railroads and corporations generally, who are in need of this class of goods.

The plant of the Standard Axe & Tool Works of Ridgway, Pa., was destroyed by fire on the 27th inst. This firm were running full time and increasing their facilities to turn out good work. Fortunately their storehouse, in which was a large amount of axes intended for August shipment, was not destroyed. We understand that new buildings of brick and iron are to replace the old, and that customers will not be greatly inconvenienced by the fire.

#### Miscellaneous.

The Board of Directors of the Natural Gas Company of West Virginia, Wheeling, W. Va., have declared the regular quarterly dividend of 1 per cent.

The Harlan & Hollingsworth Company, Wilmington, Del., will erect an iron workshop in their shipyard, 60 x 250 feet, the iron for which will be furnished by the Edge Moor Iron Company. A new three-story dry kiln is also being erected.

The Jersey City Galvanizing Company of Jersey City have just placed machinery in their works for the manufacture of riveted sheet iron piping, plain and galvanized, and are now making a special feature in the production of house leader pipe at a low cost. They have also the most approved machinery for corrugating, crimping and curving sheet iron for roofing and architectural work, as well as facilities for general galvanizing business. The company are unusually busy for this time of the year and full of orders.

W. A. Cook, Jr., manager of the Climax Road Machine Company of Albany, states that the concern, which recently suffered from a fire, does not seek any bonus from any town.

**Business in Cambridge, Ohio**—The town of Cambridge, Ohio, appears to be on the eve of a legitimate boom. Two weeks since some local capitalists commenced the formation of a company to build and operate black plate mills. Their plan of operations was similar to that recently so successful at Washington, Pa. The Cambridge Fair Grounds were purchased and laid out in building lots, 220 in number. These were disposed of in ten days, and ultimately a profit of \$15,000 will be realized from the transaction. This will be applied by the company toward the erection of six tin mills—i. e., mills designed for the manufacture of black plates for tinning. It is also probable that tinning pots will afterward be added. The plans of the mills will be made by A. Beard, New Philadelphia, Ohio, who will also act as supervising engineer. Work will be commenced within 30 days, and we are authoritatively informed that the company will be incorporated this week. In addition to this enterprise others are in view for Cambridge. The Cambridge Iron & Steel Company have purchased about 5 acres of ground adjoining their present plant, and expect in the near future to erect tin mills thereon. The Cambridge Roofing Company, whose business has steadily increased to the consumption of about 2000 tons of black and galvanized sheets per year, have for some time had the matter of building sheet mills under consideration, and will probably take action very soon. Another company of Eastern capitalists are considering the advantages of this locality with a view to the erection of tin mills and an open hearth steel plant. Cambridge has an abundant supply of cheap and good coal and excellent railroad facilities. These advantages, together with good water suitable for boilers, are the attractions which interest the projectors of the plants described.

The strike of miners in Scotland is seriously affecting the steel and shipping trades in that country.



# The Iron AND Metal Trades.

If continued, the railroad strike would cause some embarrassment to a wide territory by making it difficult for manufacturers to obtain supplies of raw material and to ship product promptly. There is another phase, however, which is more serious. The railroads have been very poor customers for the Iron manufacturers for a long time, and in many instances have been very slow and unreliable in their payments. Any injury inflicted upon them is only too likely to lead to deferring fresh orders for new material and to procrastinating on payments for goods already received.

While their best customers are in such shape, Iron and Steel manufacturers cannot expect much expansion in the demand. From that point of view this latest, unpardonable strike is a great misfortune.

The current requirements of the country continue abnormally low. The markets in raw materials and finished products along the whole line are exceedingly dull, and there is very little business in sight.

While the recording of cheerful news is the most pleasant task which falls to the lot of the journalist, he must not shirk from the duty of truthfully describing the situation, though it be painful.

The hope had been expressed in the past that a revival of business would soon follow the adjournment of Congress, never mind what that body did finally do with the tariff. In the Iron trade the opinion is still quite universal that our legislators must go home before any improvement whatever can be expected. But the hopes of a prompt recovery are now much less than they were, and at the best a very gradual bettering of business is looked forward to, in spite of low stocks in every branch of the trade.

The settlement of the wages scale by Jones & Laughlins on a sliding scale based on the quotations for Billets published by *The Iron Age* gives some promise that there will be no serious labor troubles this season.

An Eastern mill has captured the order for 500 tons of Ship Plates for the two Roach ferry boats. An order is in the Philadelphia market for about 1000 tons of Bridge Plates and 600 tons of Steel. The Structural trade is very dull throughout and the Wire trade is in its off season.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, July 3, 1894.

The railroad strike is interfering very seriously with local business. Freight trains have almost discontinued running on nearly every one of the roads centering here. Manufacturers are unable to make shipments of their products and are also being handicapped for lack of fuel. Many concerns may soon be obliged to shut down. It is likely that the number of idle workmen will be greatly augmented if the railroad strike is not speedily settled.

**Pig Iron.**—Another very active week is reported in local Coke Iron. The volume of business was fully as large as that of the previous week. The month of June closes with a good record, being the heaviest in sales for a long time. Much trouble, however, is now experienced in making shipments to consumers and the local companies are besieged with telegrams from every direction. There is danger that the furnaces here will shortly be obliged to blow out for lack of Coke. The Iroquois Furnace had expected to blow in this week and will do so if supply of Coke is received. The Southern furnace companies have not participated in the activity in business, partly because their prices are much higher than local prices and partly because they are well sold up on grades in the most demand. Some representatives of Southern concerns are not making any quotations whatever, as their principals have no Iron to offer. Lake Superior Charcoal continues quiet, and while some of the leading companies firmly maintain prices others are offering strong inducements to consumers. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$15.00 @	\$15.50
Local Coke Foundry, No. 1...	11.25 @	11.50
Local Coke Foundry, No. 2...	10.50 @	11.00
Local Coke Foundry, No. 3...	10.00 @	10.50
Local Scotch.....	11.50 @	11.75
Ohio Strong Softeners No. 1...	13.00 @	13.50
Southern Silvery, No. 1.....	@	...
Southern Silvery, No. 2.....	@	...
Southern Coke, No. 2.....	10.50 @	10.75
Southern Coke, No. 3.....	10.25 @	10.50
Southern, No. 1, Soft.....	10.50 @	10.75
Southern, No. 2, Soft.....	10.25 @	10.50
Tennessee Charcoal, No. 1...	...	...
Tennessee Charcoal, No. 2...	...	...
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.00 @	16.00
Coke Bessemer.....	11.25 @	11.50
Malleable Bessemer.....	11.75 @	12.00
Other Ohio Silvery....	14.00 @	14.50

**Bars**—Business has been better. Sales made have included large and small lots for immediate shipment and some season contracts. Higher prices have been paid on the latter on current quotations. Common Iron for mill shipment is selling at 1.05¢ @ 1.10¢, Chicago, but Iron of guaranteed quality commands about 1.15¢. The Valley mills now quote 1.05¢ at mill. Soft Steel Bars for strictly Billet stock are firm at 1.30¢ @ 1.35¢, Chicago. Small lots from store are unchanged at 1.30¢ upward for better Iron and 1.50¢ upward for Soft Steel Bars.

**Structural Material.**—Very few building contracts are now coming up, the most important being a large apartment house for the South Side. Small lots are in fair demand and yards are still kept busy on this class of work. Rumors are current of lower prices having been made on Beams by one of the leading makers. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Tees, 1.65¢; Angles, 1.45¢; Universal Plates, 1.45¢. Small lots from stock sell at 1.80¢ @ 1.90¢ for Beams, 1.50¢ @ 1.60¢ for Angles, and 1.70¢ @ 1.80¢ for Tees.

**Plates.**—A fair business is noted, the volume having been somewhat larger than that of the previous week. Jobbers continue to receive numerous orders for small lots from stock, but are seriously interfered with by the strike. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.45¢ @ 1.55¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.65¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, in carloads, 70 @ 75 % off.

**Sheets.**—Labor troubles in the Sheet mills prevent any special effort to make sales. Under the circumstances quotations for anything like early shipment are out of the question. For delivery in the future, mill shipments are quoted at 2.40¢ @ 2.45¢, Chicago, for No. 27 Common, and 75 and 10 % to 77½ % discount on Galvanized Sheets. Sheet Copper continues to be quoted at 14¢, with no discount.

**Merchant Steel.**—Negotiations are in progress on season contracts, but general business is quiet. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.45¢ @ 1.50¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

**Billets and Rods.**—Manufacturers report business flat on account of the strike. They quote Billets at \$18.25 @ \$18.50 and Wire Rods at \$25.

**Rail and Track Supplies.**—The railroad situation is so serious that business has been almost checked. Deliveries are interfered with by the railroad strike. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Nuts, 2.10¢ @ 2.15¢; Spikes, 1.75¢ @ 1.80¢; Links and Pins, 1.65¢ @ 1.70¢.

**Old Rails and Car Wheels.**—Old Iron Rails are a little dearer and quotations are now \$10.50 @ \$10.75. Old Steel Rails are unchanged at \$6.75 @ \$9.50, according to lengths and selections. Old Car Wheels, \$10 @ \$10.50.

**Scrap.**—Business is quiet. Dealers quote the following selling prices per net ton: Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.50.

**Copper.**—Lake Copper in carload lots is quoted at 9½¢ and Casting Copper at 9¢.

The Iroquois Furnace Company, for whom Forster, Hawes & Co., rooms 636 and 638, The Rookery, Chicago, are sales agents, have published an interesting little circular descriptive of the brands of Pig Iron which they make. These are as follows: Iroquois, a strong foundry Iron; Sterling Scotch, a soft, fluid and strong Iron, which will carry a fair percentage of Scrap and can be used for all general foundry purposes; Peerless, a very soft and fluid Iron, which will carry a large percentage of Scrap and make strong, soft castings; Bessemer, for open hearth and Steel casting purposes, made to any analysis wanted; Malleable Bessemer, specially intended for making malleable castings.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., July 2, 1894.

The first half of 1894 has made its record, and as regards Iron and Steel will pass into history as one of the most remarkable, if not one of the most unremunerative, that the trade has ever known. One year ago it was thought that prices were unwarrantably low, yet Pig Iron is to-day easily \$2 @ \$2.50 lower than it was then. Billets have been \$6  $\frac{1}{2}$  ton lower, and are now about \$4 lower, while Finished Material has been \$10 @ \$12 lower and is now \$5 @ \$6 lower, the recovery being in a measure due to the strike among the Coal and Coke workers. Not only have prices been lower than ever before, but the volume of business has been reduced to less than one-half, which covering an entire year is something almost beyond precedent, yet in spite of this indications are no more favorable for an immediate recovery than they were a year ago. Naturally we are one year nearer to the end of the depression, but so far as any one can see there is nothing likely to start things up in the near future. Theories of a plausible character could be built up to show that there must be an improvement soon, but unfortunately theories do not always work out right, and at best they are seldom on time. Nevertheless it is as certain as anything can be that some of these days there will be one of the old time periods of activity, but how soon and to what extent is for the future to determine.

**Pig Iron.**—The situation in Pig Iron seems to be pretty well settled. Prices have got to a point where further declines are out of the question, but confidence is not strong enough to induce consumers to load up heavily and thus start an upward movement in prices. During the first quarter of the year prices receded to the lowest figures ever known, since which time there has been a faint effort toward recovery, and in some instances an advance of 50¢  $\frac{1}{2}$  ton has been established, but it is not general. Nevertheless the situation is improving, due more to decreased stocks and decreasing production than to any actual improvement in demand. Freights from the South and West are also a trifle higher, so that local Irons meet with less competition than they did some time ago, but making the best of the situation it is far from satisfactory, as the slight advance is fully offset by increased cost of production. Still it may be noted that there is no \$10 Iron for sale, nor any \$11 @ \$11.25 No. 2X, which may be an indication of a still further movement in the direction of higher prices, although for the time being there is plenty of Iron at about 50¢ @ 75¢ advance from the lowest. Temporarily there is really nothing doing whatever, and while prices, as already stated, are held at higher figures, it remains to be seen what the ultimate outcome will be. Anything like a reasonably fair demand would certainly confirm sellers in their views, while continued inactivity might again develop weak spots. The strong point is that production is only about 35 % @ 40 % of what it was during 1891 and 1892, and furnaces that are inactive are not likely to start up unless the market presents a fairly steady appearance. Current quotations for Philadelphia and near by points are \$10.50 @ \$11 for Gray Forge, \$11.50 @ \$12 for

No. 2X, and \$12.50 @ \$13 for No. 1X, which average about \$1 less than were quoted six months ago, and are possibly 25¢ @ 50¢ better than were ruling three months ago.

**Steel Billets.**—Some extraordinary fluctuations in prices have been met with during the past six months. At the beginning of the year \$19, Philadelphia, was quoted, see-sawing from that down to \$17.50 during the first three months, and in a few instances orders were placed at \$16.90 @ \$17.25, but the heaviest end of the business averaged \$17.50 @ \$18. Since the Coke strike very little buying has been done, although prices were worked up (nominally, at all events) to \$20.50 @ \$21. To day \$19.50 @ \$20 is asked, but consumers are more anxious to get their old orders filled than to place new business. The feeling is very unsettled, and until the labor question is definitely arranged it will be difficult to arrive at any satisfactory basis for the prices of Billets. Some parties are a little inclined to discount the future and would probably quote \$18.50 for August and September to a thoroughly satisfactory buyer, but the difficulty is that this class of people have Billets due them and are not bidding for new lots. The general opinion is that while prices may go a little lower, there is very little chance of anything being done at less than \$18, and it may be that to-day's prices are rock bottom, but it will not take many days to develop how much strength or weakness there is in the current situation.

**Finished Material.**—Business during the past six months has been the smallest for years, and at prices altogether without precedent. Competition from the West was the controlling factor during the first quarter, and prices were forced to an inconceivably low point, Bars and Plates having been sold at 1.10¢ @ 1.15¢, delivered, which was from \$10 to \$12  $\frac{1}{2}$  ton below the figures ruling during the last month of 1893. The demand was very small, however, orders for anything over 100 to 200 tons being extremely rare, and most of these were picked up by Pittsburgh manufacturers at prices which local mills could not begin to meet. As a matter of fact, very few Eastern mills tried to do anything except to hold their regular trade, and even this was abandoned by some mills which have been shut down during the greater portion of the period under review. At 1.15¢ @ 1.20¢ for Plates and Bars it was impossible to clear cost, and as Western mills were taking business at those figures, there was nothing for it but to stand a-ide and let the business go. Since the Coke strike begun trade has drifted in this direction, and mills that were kept in operation during the period of close competition have been enabled to make a fairly good average, the second quarter having been decidedly favorable, particularly for Plates and Shapes, which advanced  $\frac{1}{10}$ ¢ @  $\frac{3}{10}$ ¢ from the lowest, a good deal of business having been secured at 1.40¢ @ 1.45¢, delivered. During the past couple of weeks there has been some thing of a reaction, and 1.30¢ @ 1.40¢ may be considered fair average prices for deliveries during the last half of the current month. The feeling is a little unsettled, however, and if there is no further trouble with labor in the Pittsburgh district it is not unlikely that prices will shade off again, and the reverse if there is a prospect of delay in getting the men to work.

## Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building,  
PITTSBURGH, July 2, 1894.

Late on Saturday evening, the 30th ult., an agreement was reached between Jones & Laughlins, Limited, and the Amalgamated Association over the Steel scale, and the firm signed it. The extent of the concessions secured by the firm have not been made public, but are, no doubt, sufficient to put the firm on an equitable basis with their competitors. The introduction of labor saving machinery and which will also increase the output was a prominent issue in the negotiations and made the necessity for reductions in the new scale absolutely imperative. The Sheet and Tin mill scales expired last Saturday, and as no scale has been agreed upon by the manufacturers and the Amalgamated Association, a general shut down of the Black Sheet and Tin Plate mills has taken place. Stock will be taken and repairs made, after which further conferences will probably be held. A few mills have signed the scale with the proviso, of course, that they will be allowed any concessions that may be granted other mills in future conferences. The situation in the Iron and Steel trades shows no material change over last week. Prompt Steel and Bessemer Pig are very scarce, but the demand is not urgent. Finished Material is in light demand and on certain lines prices are not as firm as during the Coal strike.

**Pig Iron.**—The furnaces in the Pittsburgh district are gradually getting in operation again. Last week Carrie No. 2 went in, as did one stack of Shoenberger & Co. Clinton has been running right along, and the two Lucy furnaces are also going. At the Edgar Thomson furnaces at Bessemer, eight out of nine stacks are in operation, "A" being the only idle stack. During its idleness "B" is on Spiegel and the other seven are making Bessemer. One Monongahela stack will likely go in this week, the other is undergoing extensive repairs. Edith, in Allegheny, is being relined and repaired and will not be ready for blast for some time yet. Soho has been idle for about three years. A number of idle stacks in the Valleys will start during the next week or two. There are few actual transactions in Bessemer Pig being closed, but prices are firm on the basis of \$10.85 @ \$11 at Valley furnace, equal to \$11.50 @ \$11.65, Pittsburgh. A leading maker is credited with a purchase of 10,000 tons of Bessemer Pig for forward delivery at the first named price. Gray Forge and Foundry Iron are in very light demand, with prices showing a weaker tendency. It is intimated that \$9.75, Pittsburgh, can be done on Gray Forge in round blocks. Bessemer Pig for July delivery is firm and scarce. For delivery during July, August and September we quote as follows:

Neutral Gray Forge.....	\$9.85 @ \$10.00, cash
All-Ore Mill.....	9.75 @ 10.00 "
No. 1 Foundry.....	11.50 @ 11.75 "
No. 2 Foundry.....	10.75 @ 11.00 "
Bessemer.....	11.50 @ 11.65 "

We note a sale of 1500 tons of Bessemer for spot delivery at \$12.25, delivered at buyer's mill.

**Billets.**—As noted elsewhere, Jones & Laughlins, Limited, have signed the Steel scale and are expected to resume next Monday. The Steel market continues quiet, very few actual sales taking place. For prompt delivery \$18

@ \$18.50 is the ruling price, with occasional sales of small lots being made. For July, August and September delivery \$17 @ \$17.25 are the ruling prices, with no large inquiries reported as being in the market.

**Structural Material.**—The demand for Beams continues excellent, the two local mills having considerable work on hand. For Beams and Channels in round lots we quote 1.25¢ @ mill. In small lots we quote at 1.30¢ @ 1.40¢, according to order. We quote Angles and Universal Plates at 1.20¢ @ 1.35¢, according to order, and Tees, 1.35¢ @ 1.40¢.

**Plates**—Pittsburgh has taken a contract for about 2000 tons of Plates, which will be used in the manufacture of about 4000 car trucks for the Lehigh Valley Railroad. The demand for Plates is moderate, but is confined nearly altogether to small lots, buyers placing their orders for immediate requirements only. We quote Tank Plate at 1.25¢ @ 1.30¢, but in carload lots with desirable specifications our lower quotation would probably be slightly shaded. We quote Shell at 1.40¢; Flange, 1.45¢; Ordinary Fire Box, 2½¢ @ 3¢; Railroad Fire Box, 3.35¢ @ 3.40¢.

**Ferromanganese.**—Prices are unchanged at \$53 for domestic, delivered at buyer's mill.

**Muck Bars.**—We continue to quote \$19.75, Pittsburgh, for best grades. We are not advised of any transactions during the week, the demand being very light.

**Bars.**—Partial resumption of operations among the Valley mills has taken place. One large mill advises us that while the outlook has somewhat improved, it is yet far from being as encouraging as desired. The starting up of a number of idle mills, in connection with light demand, has weakened prices to some extent, and it is claimed 1.05¢ at Valley mill is being shaded for desirable specifications. We continue to quote 1.05¢ @ 1.10¢ in carload lots, a Valley mill for Iron Bars, and 1.10¢ @ 1.15¢ for Steel Bars, with usual extras.

**Merchant Steel.**—Nothing of interest occurred during the week; the demand is only fair and prices continue to show a weakening tendency. We repeat quotations, as follows: Bessemer Machinery, 1.85¢; Open Hearth Machinery, 1.45¢ @ 1.55¢; Open Hearth Spring, 1.65¢ @ 1.70¢; Cold Drawn Steel Shafting, 2.40¢, base; Tool Steel, 5¢ @ 7¢ for ordinary grades; extra grades, 11¢ @ 13¢.

**Wire Rods**—Considerable figuring is being done on Wire Rods for July and August delivery, but as yet no actual transactions have occurred. Some buyers claim that as low as \$24 has been named them for July and August delivery, while sellers claim that with the high price of Billets they will stand out for \$25 at mill.

**Sheets.**—The wage scale governing sheet mills expired on Saturday night, the 30th ult., and a general shut down among Western mills has occurred. While the prospect of a peaceful settlement between the mills and the Amalgamated Association for another year is not very bright, yet it is thought an agreement will be reached just as soon as the mills have completed repairs and stock taking and are ready to resume again. The shut down has had the effect of strengthening prices to some extent, which are very firm on the following basis: No. 27

Iron, 2.35¢ @ 2.40¢, and 2.45¢ for Steel. The demand for Galvanized Sheets continues heavy, with manufacturers not disposed to book orders for forward delivery. We continue to quote at 75 and 10 % off for round lots.

**Wire and Cut Nails.**—At the recent meeting of the Wire Nail Association held in this city prices were advanced to \$1.15 base. During the week an improved demand was noticeable and makers claim they will have little difficulty in getting the advanced price, owing to the fact that most of the mills are idle, while the stocks of those in operation are badly broken. We continue to quote Cut Nails at 95¢ in carload lots for the usual averages, with the demand only moderate. The Cut Nail factory of the Laughlin Nail Company, at Martin's Ferry, Ohio, containing 226 nail machines, is again in operation after a long period of idleness.

**Barb Wire.**—Business is light with prices unchanged. Considerable Wire is being sent out from this country to Canadian markets. We quote Four-Point Galvanized at \$2.05 @ \$2.10, in carload lots, and Plain Wire at \$1.40 in same quantities.

**Skelp Iron and Steel.**—There is a decided scarcity of certain sizes of both Iron and Steel Skelp, and prices are firm. We quote as follows: Grooved Steel Skelp, 1.15¢ @ 1.20¢; Sheared Steel Skelp, 1.25¢ @ 1.30¢; Grooved Iron Skelp, 1.25¢ @ 1.35¢; Sheared Iron Skelp, 1.40¢ @ 1.45¢.

**Pipes and Tubes.**—There are no new conditions prevailing. The demand for regular Merchant sizes is quite heavy, with prices ruling firm. The inquiry for about 8 miles of 8-inch referred to last week has not been placed, but in all probability Cast Iron Pipe will be used, as it is considerably cheaper than Wrought Iron Pipe.

**Connellsville Coke.**—While the situation as compared with a week ago is considerably improved, the strike still hangs on, but may be terminated at any time. Last week Patrick McBride, secretary of United Mine Workers, visited the Connellsville region and held a conference with Thomas A. Lynch, superintendent of the H. C. Frick Coke Company. Mr. McBride desired to arrange a conference between the striking Coke workers and the Frick concern, but was informed by Mr. Lynch that under no conditions would such a conference be entered into and the strikers must return to work under the terms set forth in the Frick scale which became effective on February 1 last. Later information shows that the contract for Coke for last half of the year reported last week as being closed by a Valley concern at \$1 ⅔ ton was on the basis of 10 tons of Coke for 1 ton of Bessemer Iron, thus making the price of Coke, based on the present price of Bessemer Iron in the Valley, somewhat higher than \$1 ⅔ ton.

(By Telegraph.)

The wage scale just agreed upon between Jones & Laughlins, Limited, and the Amalgamated Association is a sliding scale based on the selling price of 4 x 4 Billets. For every average advance of 25¢ ⅔ ton in Billets over the base price during any three months wages will be advanced 1 %, and for every decline of 25¢ will be reduced 1 %. The market quotations on Billets, as appearing in *The Iron Age*, will be used by the committees representing

the firm and the Amalgamated Association in making up the average price of each three months. The plant of Jones & Laughlins is idle this week, undergoing repairs, but will be started up in all departments next Monday.

The Carbon Steel Company of Pittsburgh, manufacturers of Open Hearth Steel, have recently opened an office in the Havemeyer Building, New York City, in charge of W. M. Wilson, who will have entire charge of all the railroad business of this concern in the Eastern markets. The same firm have opened an office in the Western Union Building in Chicago in charge of James B. Brady, who will have entire charge of all railroad business of the firm in Western territory. In addition to these two offices this concern have agencies in Chicago, Cincinnati, Cleveland and Philadelphia.

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, July 3, 1894.

Just as the business community are recovering from the effects of the Coal strike they are now confronted with what promises to be the greatest railroad strike this country has ever witnessed. While scarcely a week has elapsed since the strike was declared yet it has made itself felt throughout the entire country. It is difficult to determine what the result will be, but one thing is certain, it will tend to make the business still more muddled and unsettled than it was. Shipments are being delayed in every quarter and even the passenger service of some roads is suspended. With a question like this confronting the manufacturers and jobbers of the country it is difficult for them to see very far into the future.

**Pig Iron.**—The situation is practically unchanged. The demand is of a hand to mouth character, and just now this method seems to suit the furnaces as well as consumers. There is some Iron being offered at a trifle under the market, but sales are not increased any by the shading of prices. No. 2 Foundry is obtainable to-day at \$7.25 @ \$7.50, but as there is practically no stock on hand and as the demand for this grade of Iron is steadily increasing, the price just quoted is considered low, and some furnaces refuse to fill orders at \$7.50, asking 25¢ ⅔ ton more. The hot weather of July and August is likely to prevent any large movement in Iron, but with the opening of the fall trade things are likely to change for the better. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry .....	\$11.00 @ \$11.25
Southern Coke, No. 2 Foundry .....	10.00 @ 10.25
Southern Coke, No. 3 Foundry .....	9.75 @ 10.00
Gray Forge .....	9.25 @ 9.50
Southern Car Wheel .....	16.50 @ 17.00
Ohio Softeners .....	14.25 @ 14.75

**Bar Iron.**—The demand is exceedingly light except for some special sizes. Car works are not in the market, and are not likely to be for 60 days. The local jobbers report a fair trade only. We quote as follows: Carload lots from mill command 1.15¢; jobbers quote 1.30¢ @ 1.35¢, according to quantity.

**Barb Wire.**—The dull season is now here and the inducement of lower prices would not increase trade to any extent

whatever. Prices are firmly held and are quoted as heretofore. Painted in carload lots, from mill, \$1.90, with 40¢ hundredweight additional for Galvanized.

**Wire Nails.**—There is no change to report either in the demand or price. Mills are only working part time and stocks are accumulating. Mills quote \$1.20 @ \$1.25 for carload lots from mill.

**Rails and Track Supplies.**—There is nothing doing in this department. Old Iron Rails are dull and neglected at \$10, f.o.b. cars St. Louis. Steel Rails are in the same condition at \$26 @ \$27. Track Supplies are quoted as follows: Splice Bars, 1.35¢; Spikes, 1.75¢; Bolts, Square Nuts, 2¢; with Hexagon Nuts, 2.10¢; Steel Links and Pins, 1.65¢; Iron, 1.75¢.

**Pig Lead.**—This metal continues in the weak condition noted in our last report. Offerings are not unusually heavy, and yet on the other hand there is no urgency in the demand. Sales are reported of several hundred tons at from 3.10¢ to 3.12½¢, the former figure representing the market at the close today.

**Spelter.**—Sales have been confined largely to carload lots, which are quoted at 3.15¢ @ 3.20¢. The latter figure is now the asking price, but consumers have settled on 3.15¢ as the purchasing price and refuse to pay more than this. The result is a dull market.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,  
CINCINNATI, July 3, 1894.

There has been a light trade in Pig Iron during the past week, but there were no large offerings, and while the demand was small it was about large enough to take the limited offerings at previous prices. There was only a jobbing demand in this district, mainly for single car lots, and there was little demand from the East, the advance in Eastern freight rates July 1 tending to restrict business, but that was overshadowed by the troubles of the railroads, which it is believed will not last long and will therefore have only a temporary effect. The resumption of Coal mining has not yet materially increased the production of Pig Iron, and the market is still laboring under the disadvantage of a scarcity of iron, but no one is disposed to pay an advance, as they would have to do to buy any considerable quantity. Some of the Southern furnaces have withdrawn entirely from the market, and say they will not sell until prices advance to a remunerative basis. While prices are not quotably higher, a strong and confident undertone prevails. Quotations are as follows:

### Foundry.

Southern Coke, No. 1.....	\$10.25 @ \$10.50
Southern Coke, No. 2.....	9.50 @ 9.75
Southern Coke, No. 3.....	9.25 @ 9.50
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.....	11.50 @ 12.00
Hanging Rock Charcoal, No. 1..	17.00 @ 17.50
Hanging Rock Charcoal, No. 2..	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

### Forge.

Gray Forge.....	8.75 @ 9.00
Mottled Coke.....	8.50 @ 8.75

## Birmingham.

BIRMINGHAM, June 30, 1894.

The strike situation is about the same as last week. Some conferences were proposed, but nothing resulted therefrom. The operators claim that they can make no advances and are getting all the coal needed; that prices of Iron are still so low that they are not over-anxious to increase outputs or resume. The miners, on the other hand, claim that they will hold out till fall elections and gain their points yet. Meanwhile, the State troops are still encamped at Ensley, to keep the peace and protect property. Bridge burning has ceased for the time being, all bridges being heavily guarded by State and Federal deputies. That the Coal is not yet what it ought to be in quality is shown by the increased Coke consumption and decreased daily output. A few weeks more will, however, remedy this.

**Pig Iron.**—The market ought to be ripe for an advance in prices. Stocks are at a dangerously low figure, with the exception of one concern who have from 20,000 to 25,000 tons in their yard, which they hold for a material advance in prices. There are no stocks to be seen at the yards. Soft Irons are particularly out of the market. Gray Forge is the same. If the companies could unite on a policy and act in harmony, there ought to be no trouble in advancing prices \$1 or more. What is held in Warrant yards was bought at high prices and is not likely to disturb the market. The increase in freight rates to take place soon will in all probability cause a like increase in prices. Western freights will advance July 1 25¢ per ton, some more some less. Eastern freights will be advanced July 31. Orders are now refused daily by one large concern and exceed output in another. There is no change in prices reported as yet. No. 1, \$8; No. 2, \$7.25; Gray Forge, \$6.50. Some White Iron was sold last week at \$6.50, and \$6.75 @ \$7 is asked for further sales of this grade. Collections are reported good and prompt.

**Rails and Track Materials.**—There are no further sales closed, but George C. Ball & Co. report increased inquiries from various points for fairly large quantities.

**Later.**—Governor Jones has just issued orders for the State troops to leave camp for home, as the necessity for holding them appears past. They will remain under cautionary orders and be prepared to go back on short notice.

## Louisville.

LOUISVILLE, KY., June 30, 1894

The demand continues light on the part of most Iron consumers. Stove companies are almost all shut down, with little work; car companies are either closed entirely or running on small orders; Pipe shops report good business, but prices yet show no improvement with them. The scarcity of Soft and Silvery grades continues and their price has advanced, so that No. 2 Soft Iron is selling for as much as Foundry. Consumers, however, are only buying at present prices from week to week, and are not willing to contract for a large amount. There is no movement in Car Wheel Irons, and they are very much depressed. The coke situation is also a factor in the depression and manufacturers continue to be affected by the scarcity of Coke.

We quote, for, cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry.....	\$10.25 @ \$10.50
Southern Coke, No. 2 Foundry.....	8.75 @ 9.25
Southern Coke, No. 3 Foundry.....	8.50 @ 8.75
Southern Coke, Gray Forge.....	8.00 @ 8.50
Southern Charcoal, No. 1 Foundry.....	12.50 @ 13.50
Southern Car Wheel.....	15.00 @ 15.50

## Metal Market.

**Pig Tin.**—The movement in prices has been narrow. The speculative trading was no broader. Purchases for jobbing and consumptive account were on strictly conservative lines. In short, it has been an uneventful week except as far as transfer of stock from Europe to America is concerned. This transfer, while apparently relieving Europe statistically, has added to recorded American holdings and along with the stock afloat from primary points caused an estimate of the visible supply for Europe and America to be raised to 19,500 tons. This is 450 tons more than was recorded for June 1. The total is also much above the average and would strengthen the popular belief that there is enough Tin in sight to go around. Still prices have not varied to any remarkable degree. The lowest has been 19.25¢, net cash, and the highest 19.35¢, same terms, for early delivery. At the close on Tuesday 19.25¢ was bid and 19.35¢ asked for current month delivery. There were arrivals on Tuesday of 200 tons, making a total of 250 tons since the 1st inst.

**Copper.**—There has been no improvement in home trade or export demand. Only small orders and comparatively few of those have been placed here. In short, the market has remained positively dull. Prices are somewhat variable. Thus, up to 9.15¢ was paid for 25,000-lb lots of Lake Superior Ingot in some quarters despite offers at 9.10¢ elsewhere, and in the face of intimations that 9¢ would be accepted for round lots. The cheaper sorts have met with fair sale at practically unchanged prices, say 8½¢ @ 8¾¢ for Electrolytic, and 8½¢ @ 8¾¢ for common casting stock.

**Pig Lead.**—Common domestic has been sold to the extent of 300 to 400 tons, prompt shipment and on the spot, at 3.37½¢ @ 3.40¢ respectively. These and previous purchases have cleaned up spot stocks and left very little for smelters to send forward during the balance of the month. Hence needy buyers are asked 3.45¢ for prompt delivery. Bids of 3.40¢ have been turned down in some instances. Forward shipments are, however, at some discount. Thus August was openly offered at 3.35¢ and bids a shade less were solicited in a manner that was at least suggestive of anticipation of more liberal supplies during the autumn months. The latter solicitation had something of a speculative air. The stiff prices paid for prompt deliveries and prompt shipments indicated positive need of stock.

**Spelter.**—Buying has been slow in this quarter and inquiries have not increased in any remarkable degree. Orders have gone out from other quarters in sufficient number to have a perceptible effect upon the primary markets and this, in turn, makes it difficult to secure stock for delivery at New York or common point at prices that were common a short time ago. There are no offers of ordinary brands at less than 3.50¢, and asking prices are 3.52½¢ upward.



**Antimony.**—The market has been quiet and prices are easy. Hallett's is quoted at 8½¢ @ 8¼¢; Cookson's at 10¢ @ 10¼¢, and other brands correspondingly.

**Nickel.**—Quotations range from 43¢ to 50¢, according to delivery and size of lot.

**Tin Plates.**—A poor market is still experienced. Orders for future deliveries are being placed in a very conservative way, and the buying of spot stock is almost exclusively of hand to mouth character. Supplies here are only fair and the assortment is somewhat broken, but that fact is offset by heavy stocks in Europe that may be moved on short notice. The quantity at Swansea is reported as being over 300,000 boxes. Spot prices are as follows: Charcoal: Melyn grade, IC, \$6.25; do., Melyn grade, Crosses, \$7.75; do., Allaway grade, IC, \$5.40; do., Allaway grade, Crosses, \$6.45; do., Grange grade, IC, \$5.50; do., Grange grade, Crosses, \$6.60; do., Terne, M.F., 14 x 20, \$7.25; do., M.F., 20 x 28, \$14.50; do., Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11; Alyn grade, 14 x 20, \$5.15; do., 20 x 28, \$10 @ \$10.25; D. R. D. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.70. IC Coke: Penlan grade, \$5; do., J. B. grade, 14 x 20, full weight \$5.15; do., 100 lb. \$4.75; do., 95 lb. \$4.62½; do., 90 lb. \$4.55. IC Bessemer Steel, Coke finish: 14 x 20, full weight, \$5.12½; do., 100 lb. \$4.70 @ \$4.75; do., 95 lb. \$4.60; do., 90 lb. \$4.50. IC Bessemer Steel, Coke finish, sq., \$5.30. IC Siemens Steel, Coke finish, sq., \$5.45. Wasters: S. T. P. grade, 14 x 20, \$4.60; do., S. T. P. grade, 20 x 28, \$9; do., Albearne grade, 14 x 20, \$4.90.

## New York.

Office of *The Iron Age*, 96-102 Reade street, }  
New York, July 3, 1894. }

**Pig Iron.**—The market continues very quiet and is steady, some of the Southern producers having practically withdrawn. We quote standard brands \$12.50 @ \$13 for No. 1; \$11.25 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

**Ferromanganese.**—There is a modest amount of inquiry, but some of the sellers of foreign are not getting any business, their prices being too high. We quote nominally \$52.50 @ \$54 for 80 % foreign Ferromanganese.

**Billets and Rods.**—The market is dull. Western reports indicate a decline to less than \$17, Pittsburgh, for future Billets, and \$24 for Rods. We continue to quote \$19.50, tidewater, for Billets and \$26.75 @ \$27 for Wire Rods, tidewater.

**Steel Rails.**—The trade is exceedingly dull in all its branches.

**Track Material.**—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

**Manufactured Iron and Steel.**—No business of any magnitude has been closed in the Structural trade in this city, and sales in Plates and Bars are very light. An easier feeling prevails for the future. We quote: Beams up to 15-inch, 1.40¢ @ 1.50¢

for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.35¢ @ 1.40¢ for Tank; 1.45¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.20¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 70¢ @ 75¢ @ 45 lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.75¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

**Old Material.**—Since the last sale of about 500 tons of Scrap for shipment to Italy nothing has been done in that direction. On the whole the shipments thus far of Old Steel Rails to Italy have been between 4000 and 5000 tons. A part of the Italian demand has since been covered by sales of Old Rails from Sweden. An offer of \$11 for a lot of 4000 tons of Old Iron Rails on the line of a road in Ohio has been declined.

## Financial.

The favorable effect produced by the settlement of the coal strike and the prospect of an approaching termination of the tariff uncertainty has been more than offset by another serious setback to reviving business activity which has developed during the week. The action of the American Railroad Union in boycotting all railroad lines using Pullman cars has induced a very serious strike, involving the whole railroad system of the country west of Chicago and threatening to affect more or less seriously the traffic and business of the entire country. Already the effects of the strike have proved most injurious to industry generally, and the extent of the possible disaster, should the disturbance be of long continuance, can only be imagined. Happily the resolute stand taken by the railroad companies and the decisive action of the Government in the matter give cause for believing that the duration of the strike will be brief, particularly as the pecuniary resources of the union are said to be inadequate for carrying on a protracted struggle. Moreover, the arbitrary action of President Debs and the officials of his organization in suddenly depriving many hundreds of thousands of workers and their families of the means of livelihood because Mr. Pullman and his workmen cannot agree as to the wages the latter should receive, is not regarded with favor by the older and more conservative of the labor unions.

Nevertheless the immediate effect of such an extensive disturbance of traffic has been to put off the business recovery which might otherwise have been expected at this time, when, in addition to the favorable features before alluded to, the financial world is encouraged by the practical cessation of gold exports and the checking of the drain on the Treasury gold reserve by the voluntary contributions of the New York banks. Crop prospects, too, are regarded as being very promising, and in many ways the business horizon appeared to be clearing until Debs arose in his might and began to "break things."

The monthly Treasury statement, issued on Monday, is regarded as con-

siderably more favorable than was generally anticipated. For the first time in many months the receipts showed little or no deficit, as compared with expenditures. The general Treasury balance on June 30 was \$117,584,436, against a balance on May 31 of \$117,854,335. This statement exhibits a striking contrast to that of the previous month, which showed a net loss in May of nearly \$7,250,000. The main cause of the June increase is found in an increase in the internal revenue receipts of more than \$3,000,000, as compared with May. The customs receipts showed further losses, attributable to the delay of importers in taking goods out of bond while tariff changes are impending. The unfavorable feature of the statement was the decline of the gold balance from \$78,700,000 a month ago to less than \$65,000,000 on July 1.

The receipts of gold at the New York Custom House during June were less than 2 %, while silver certificates constituted 83.6 % of the gross receipts. The national banks continue to increase the circulation in spite of the plethora of money at New York. The total circulation is \$207,259,307, showing an increase of \$108,625 during June, and the circulation based on bonds is \$180,568,584, an increase during June of \$49,336. The lawful money on deposit for redemption purposes is \$26,690,723, the aggregate national bank note circulation has increased during the past fiscal year \$28,644,772, and the circulation based on bonds has shown a net increase of \$22,667,485. The 5 % bonds are now on deposit to secure circulation to the amount of \$4,849,950 and to secure public deposits to the amount of \$450,000.

The statement is made from an alleged authoritative source at Washington that no issue of bonds will be made by the Administration this summer. The President and Secretary Carlisle are said to be in thorough accord on the financial policy of the Treasury. They express their belief that the end of gold exports to Europe has arrived, that the new tariff bill will go into effect by August 1, and that from thenceforward increased revenues may be looked for. The shipments of gold last week were less by far than those of the previous week. They amounted to \$2,500,000; and this week, so far, only \$350,000 have been sent abroad, while the falling of foreign exchange below the point at which the metal can be exported with profit gives ground for the belief that the gold export movement has culminated.

Saturday's statement of the New York banks showed a decrease in the surplus reserve of \$1,552,000. In view of the recent heavy shipments of gold to Europe a much heavier falling off had been looked for. These had, however, been largely offset by the continued large receipts of currency from the interior. Loans expanded \$1,760,700; and the changes in deposits and circulation were insignificant. The banks now hold \$74,800,000 in excess of legal requirement, against only \$1,250,000 at this time last year. The volume of domestic business shown in Clearing House payments throughout the country last week was 27.3 % smaller than for the corresponding week of last year.

*Dun's Review* says regarding this year's failures: "Our weekly returns show gratifying improvement over last year. In June the failures have been about 950, and in the half year about 7100. The aggregate of commercial liabilities only, with part of June lacking, has been

\$13,183,465, against \$13,515,760 in May, \$3,816,862 in April, and \$99,498,366 in the half year. At the East the liabilities were about \$48,000,000, at the West \$26,000,000, and at the South \$25,000,000. The classified returns show about \$41,000,000 of manufacturing and \$52,000,000 of trading liabilities. This week the failures have been 214 in the United States, against 307 last year. Of late the number and importance of failures have increased a little, as is usual near the close of a half year. *Bradstreet's* estimates the total liabilities of business failures during the first half of 1894 at \$82,555,000, compared with \$170,860,000 the same time last year, and \$56,535,000 in the same period of 1892.

Railroad earnings continue unsatisfactory, those for the second and third weeks in June being estimated by the *Financial Chronicle* as showing a falling off of 20.94 % and 20.25 %, respectively, as compared with last year. For the entire month of June the decline will probably be found to approximate 22 per cent. The Pennsylvania Railroad Company's statement for May is very significant as reflecting the extent of the losses caused by trade depression, strikes, floods, &c., in that month. As compared with May, 1893, the statement shows a decrease in gross earnings of \$1,813,919, a decrease in expenses of \$864,313, and a decrease in net earnings of \$949,605. The five months of 1894, as compared with corresponding period of 1893, show a decrease in gross earnings of \$6,017,059, a decrease in expenses of \$4,657,384, a decrease in net earnings of \$1,359,674. All lines west of Pittsburgh and Erie for May, 1894, as compared with the same month in 1893, show a decrease in gross earnings of \$1,090,268, a decrease in expenses of \$354,280, a decrease in net earnings of \$735,988. The five months of 1894, as compared with corresponding period of 1893, show a decrease in gross earnings of \$3,457,812; a decrease in expenses of \$2,377,283; a decrease in net earnings of \$1,080,528.

Ease still characterizes the money market. Call loans are nominally 1 %, and time money continues in abundant supply at easy rates. Competition is keen among lenders and the offering is largely in excess of the demand. Rates are 1 % for 30 days, 1½ % for 60 days, 2 % for 90 days, 2½ % for four months, and 3 % for longer periods. Rates for commercial paper show some improvement, owing to the withdrawal from the market of some heavy buyers in consequence of the expected demand for July disbursements and later requirements from the South for crop moving. The supply of good paper is limited and the market is quiet. Rates 2½ % @ 3 % for prime indorsements, 3 % @ 3½ % for first-class single names, four months to run, 4 % @ 5 % for others.

On the Stock Exchange business has been, if anything, duller than the dullness mentioned last week. Transactions have been the narrowest recorded for some time, and prices are virtually unchanged. Even sugar has been quiet; and the news of strikes and boycotts has not sufficed to affect the market, which closed on Tuesday quiet, but firm. Of the railroad stocks, St. Paul has been the leader, and together with the granger group displayed considerable strength. The May statement of the company makes it pretty certain that the 4 % dividend on the common stock will have been earned the last fiscal year. Burlington is the only other railroad stock that has displayed any life. Chicago Gas declined on Monday,

following on the announcement of the result of litigation in the matter of the Gas Trust in Chicago.

The market for railroad and miscellaneous bonds, while not markedly active, has been much more so than the stock market. Municipal bonds have been specially strong and active. On Tuesday, however, the market closed dull and irregular. Government bonds have been fairly active and firm. Closing quotations were as follows:

	Bid.	Asked.
2's, 1891, registered.....	96	.....
4's, registered.....	113	113
4's, coupon.....	113½	114½
5's, registered.....	117½	118½
5's, coupon.....	117½	118½

Sterling exchange has weakened below the gold shipping point on a limited demand and a better supply of bankers' bills. The low rates of interest prevailing prevent selling of cotton and grain bills against future shipments. Actual business was done on Tuesday at \$4.87 @ \$4.87½ for 60 days, \$4.88 @ \$4.88½ for demand, \$4.88½ @ \$4.88½ for cables and \$4.86½ @ \$4.86½ for commercial. Domestic exchange on New York is quoted as follows: Charleston, buying par, selling ½ premium; Chicago, 75 premium; Savannah, buying par, selling ½ premium; Boston, 5 @ 10 premium.

Bar silver is firm and stronger. London quotations are 28½ pence ½ ounce, and New York, 62½¢, nominal. There are signs of returning steadiness in the market for silver, owing to reduced production and a good demand in the far East. Silver exports in June averaged less than \$500,000 per week—\$300,000 less than the average exports of February.

The Philadelphia & Reading Railroad has again defaulted on the semi-annual interest of its general mortgage 4 % bonds, amounting to about \$800,000. This is the third successive time. Atchison stockholders, who are opposed to the proposed assessment, have organized a permanent committee to fight the scheme of reorganization.

Judge Ingraham of the New York Superior Court has denied the motion for an injunction to restrain the issue of the new \$70,000,000 second mortgage Erie bonds, holding that the courts of equity are competent to look after the interests of the minority where it is clearly shown that their interests are jeopardized, but that small bondholders, unless they can show that their interests are jeopardized, should not seek to restrain the will of the great majority.

## British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, TUESDAY, July 3, 1894.

Pig Tin prices went as low as £68. 10/ for prompts, or to the parity of forwards, owing to lack of speculative support and free selling by holders who were unnerved by the statistical exhibit. From the extreme lowest point some reaction has taken place, on covering of "bear" accounts, and futures again commanded a premium. At the close the market was in a somewhat feverish condition, with dealings at £68. 15/ @ £69 for prompts and £69. 5/ for three months' futures. London stocks have decreased 648 tons the past

month. Straits shipments were 2550 tons.

Copper has been quiet, but prices improved under fair speculative demand, £38. 5/ having been realized for Merchant Bar prompts. The buying was chiefly of prompts, but better general demand has been experienced. Consumers are moving cautiously. Closing prices were £38. 7/6 for Merchant Bar, prompt delivery, £38. 15/ for do., three months' futures, and £41 for best selected English.

Spot stocks have increased 19 tons and the visible supply 915 tons during the past fortnight. Chili charters during the same period were 800 tons.

Spelter has advanced on actual sale to £15. 15/ on large buying for Continental account, supposed to be for a syndicate who seek to control production. Most holders now ask £15. 17/6.

Pig Lead is somewhat firmer, at £9. 2/6 @ £9. 5/ for Soft Spanish, but dealings have been moderate and the demand is only fair.

Tin Plate has undergone no decided change. The demand is chiefly for small or retail lots. Generally prices are maintained, but some sellers are cutting slightly. The majority are booked ahead and prefer to wait. There is more inquiry for light weight Cokes than for other sorts. The Old Castle works have restarted and several other establishments are preparing to resume. Swansea prices are as follows:

Bessemer Cokes, 14 x 20.....	@ 10/3
Siemens Cokes, 14 x 20.....	@ 10/6
Ternes, double box.....	@ 19/
Charcoals.....	13/ @ 15/

The Pig Iron market has been dull, but prices for warrants have advanced slightly, owing to threatened famine of fuel by strikes. About 25 Scotch furnaces have been damped. Prices on warrants have advanced to 42/1 for Scotch and 35/4½ @ 35/6 for Cleveland. About 44/3 @ 44/6 is quoted for Hematite.

The Pennsylvania Steel Company advise us officially that there is no foundation for the reports that the company have sold their interest in the Juragua iron mines of Cuba to their associate in the property, the Bethlehem Iron Company.

The Tin Plate Consumers' Association of the United States have issued a "statement" under date of June 28 in which they attempt to prove that the cost of the McKinley duty of 2.2 cents per pound has been \$14,500,101.55 in three years. Even if the figuring were correct, which it is not, the table of Charles S. Trench, who is the compiler, proves that out of this sum \$11,000,550.46 went to the Treasury in the form of increased duties. This does not include the duties received on black plates imported for dipping, nor is any allowance made for the exports of foreign tin plates under the drawback system.



### Scale Matters at Pittsburgh.

Late on Saturday evening, June 30, an agreement was reached between Jones & Laughlins, Limited, of the American Iron & Steel Works, at Pittsburgh, Pa., and the Amalgamated Association over the steel scale, and it was signed by the firm, thus removing all possibility of a rupture between this firm and the Amalgamated Association. Of course, the concessions secured by the firm have not been made public, but it is understood that such reductions were made in the new scale as will put the firm on a more equitable basis with their competitors. During this week improvements and additions to equipment in the steel plant of the firm are being made, but it is expected to have these completed so that operations can be resumed in all departments on Monday, July 9. Since our issue of last week the American Tin Plate Company, Ellwood, Ind., and the Morewood Company, Gas City, Ind., and P. H. Laufman, Limited, Pittsburgh, Pa., with works at Freeport, Pa., have signed the tin mill scale. The Sharon Iron Company, Limited, Sharon, Pa., have signed the black sheet mill scale; the Falcon Iron & Nail Company, Niles, Ohio, have signed the scale of the Amalgamated Association so far as it relates to their puddling and skelp departments, but will probably allow their tin and sheet mills to remain idle until a scale governing these departments has been formulated. The Eagle Iron & Steel Company, Ironton, Ohio, and the Duluth Mfg. Company, Duluth, Minn., have signed the iron scale. As yet nothing has been done looking to further conferences between the black sheet and tin plate manufacturers and the Amalgamated Association, and as the scale governing these departments expired on Saturday night, June 30, a general shut down has occurred among all mills making black sheets and sheets for tinning purposes. The period of idleness will be taken advantage of to take stock and make necessary repairs, and it is not improbable that it will be some little time yet before further conferences are held. Jennings Brothers & Co., Allegheny, Pa., operating a sheet mill at Leechburg, Pa., have posted notices in their plant to the effect that in the future the concern will refuse to treat with the Amalgamated Association and will operate their plant with non-union men.

The St. Paul Pioneer Press some two years ago made the first attempt to figure out the profit to the shipper in the exportation of wheat from Duluth to Liverpool, after deducting all charges for transportation, elevator tolls, insurance, &c. "Since then, by legislative requirement, the Railroad and Warehouse Commission has undertaken to keep the public posted, not on what was gained or lost on any given shipment of wheat, but on the comparative prices of wheat at Duluth and Liverpool at any given date, with all intermediate charges added. Thus, according to a statement just issued, No. 1 hard wheat on June 1 sold in Duluth for 57.88 cents a bushel, and Liverpool on the same day for 70.50 cents a bushel. But the various transportation, elevator, insurance and other charges which had to be paid on that wheat before it reached Liverpool amounted to 11.85 cents, of which 7.55 cents were for freight and insurance, the remainder being elevator, weighing, inspection, commission and other charges. So that the cost of the

grain to the Liverpool merchant which he sold on June 1 for 70.50 cents was 69.73 cents, and all he could have made on it, supposing he had paid the Duluth price on June 1, was  $\frac{7}{100}$  cent. These official statements of comparative prices at Duluth and Liverpool and of the cost of transporting it have completely put an end to the cry which gave rise to the investigation that the profits which the farmer should realize on his wheat by a higher price at Duluth were absorbed by middlemen and transportation companies in shipping it to Liverpool."

### Bronze Doors of Trinity Church, New York.

A masterpiece of the sculptors' and founders' arts has recently been completed and exhibited at the Henry-Bonnard Bronze Works, New York City, in the shape of a pair of magnificent bronze central doors for old Trinity Church, New York. These doors are probably the most important piece of work of the kind yet produced on this side of the Atlantic. They form, together with the two pairs of side doors already in place, the Astor memorial, of which Richard M. Hunt is architect. The side doors are the work, respectively, of J. Massey Rhind and Charles H. Niehaus, and the central portals now ready to be placed have been designed and sculptured by Karl Bitter. The doors are surmounted by an elaborately wrought stone tympanum, representing Christ opening the gates of Heaven. The bronze doors are in two leaves, each 11 feet high by 4 feet 2 inches wide, giving to the whole portal a height of 18 feet. Each of the doors weighs 4200 pounds, and is made up of three panels in high relief, representing biblical scenes. The panels are surrounded by a border, containing on the sides 12 niches holding figures of saints, with intervening heads of men and women, and, on the top and bottom, the symbols of the four Evangelists, with reclining figures representing Eternity, Justice, Mortality, Sin, Time, &c. The panels depict, respectively, the Expulsion of Adam and Eve from Eden; Jacob's Dream; the Annunciation of the Virgin; the Resurrection; and two apocalyptic scenes.

The whole work is remarkable for its majestic effect and high artistic feeling. The completeness of the detail and the harmonious blending of the design leave little to be desired; and the work is well worthy of comparison with the famed Ghiberti doors at Florence, which occupied the better part of the artist's lifetime in execution. These doors have been three and a half years in completion. They form, moreover, a remarkable specimen of skillful casting, some of the figures being in almost full relief, and many of the designs being of a most delicate and intricate character. The Bitter doors are a grand example of American art production, which reach truly monumental importance.

Reports from United States Consuls throughout the world, received and published by the State Department, disclose the fact that American lumber is shipped to every country on the globe; and that, while in many lands the market is virtually controlled by the shippers of the United States, there are numerous openings for still further increasing the trade. American timber seems to be more widely known than any other article of national production.

### The New Tower Bridge.

The recently completed Tower Bridge, the latest and most imposing of all the bridges of London, was opened with great ceremony by the Prince of Wales on Saturday. The new bridge, which is the nearest to the entrance to the Thames River, has been erected for the purpose of relieving London Bridge of a portion of its enormous volume of traffic, amounting to an average of about 25,000 vehicles and 125,000 foot passengers daily.

The Tower Bridge is a double one, a combination of a high level and a draw-bridge, the latter feature being rendered necessary by the fact that large vessels ascend the river as far as London Bridge. It is composed of two immense piers, each consisting of four hexagonal steel barrels, laced together by a network of lattice girders, the whole being filled in with brick and faced with stone. From the towers stretches a suspension bridge from bank to bank. The mid-span is approached on either side by a steep flight of stone steps, 140 feet in height; but elevators inside the towers are also used for conveying foot passengers to the upper bridge when the draw spans are open. These latter are on a level with the roadway on the river bank and are technically known as bascules. Each bascule is 100 feet long and revolves on a 21-inch steel bar. When it is necessary to allow large vessels to pass, the traps are lifted, the short leg of the bascule, inside the tower, being heavily weighted with lead and a space being left in the pier in which the half span sinks when elevated. The bascules are operated by very powerful hydraulic machinery.

The Biwabik Bessemer Company is the name of a new corporation with headquarters at the village of Biwabik, Minn. The company are incorporated, with \$50,000 capital stock, and will carry on a general business in smelting and refining ore for the purpose of placing it on the market. The incorporators are H. B. Shields of Girard, Ohio, and Tod Ford and C. D. Hine of Youngstown, Ohio.

The Tasmanian International Exhibition to be opened at Hobart, Tasmania, next spring promises, says the Australian press, to be a very successful undertaking. It is receiving very wide support. Great Britain, India, Canada and the United States are likely to be well represented by exhibits, and all the British Australasian colonies are co-operating heartily in the scheme. As a means of introducing new inventions into the increasingly important countries of Australasia the exhibition is likely to be valuable to foreign manufacturers and producers.

Reports from American ship owners received by the Bureau of Navigation, Treasury Department, show that Americans own under foreign flags 64 steel or iron steam vessels, of 197,108 gross tonnage, in the transatlantic trade. The steel or iron steam tonnage in transatlantic trade under American registry consists of 82 steamships, of 175,367 gross tons, of which 19 steamships, of 42,821 gross tons, were built abroad, and have been permitted to fly the American flag by special act of Congress. These latter include the "New York" and "Paris."

# HARDWARE.

## Condition of Trade.

**T**HE PRESENT WEEK, broken as it is by a national holiday and at the commencement of the summer dullness, finds trade reduced to a minimum. A feature of special importance at this time is the great railroad strike, which, besides interfering with current business, is assuming ominous proportions and has a disquieting effect on the public mind. There is little new to report in the Hardware market, manufacturers and jobbers as a rule having withdrawn their travelers and are giving little attention to the active prosecution of business. Many of the mills and factories are reducing their production or shutting down entirely for a few weeks in order to enable them to make the necessary repairs and improvements so as to be in efficient condition for future operations. In the matter of prices the market continues as for some time, nearly all goods being offered at very low figures, from which there is yet no recovery. There is, however, a disposition on the part of manufacturers to be conservative in the matter of prices and to refuse to sell goods at unremunerative figures. The experience of the past year has led prudent manufacturers and merchants to give very careful attention to the manner in which they are conducting their business, scrutinizing costs closely and reducing expenses wherever possible. A further effect of this will probably be found in a more conservative and careful policy than has characterized the operations of many of them in the past, and in this way it is not unlikely that good effect from the peculiarly trying year that has passed will be found in trade circles for some time to come. There is a general feeling that while trade for a few weeks will probably be quiet, fall business will be at least fair, and there are some careful observers who are anticipating a large demand and a speedy return to normal conditions. Reports in regard to crops are for the most part exceptionally favorable, and there is little general complaint in regard to collections.

## Chicago.

(By Telegraph.)

Owing to the railroad strike the freight officials are now notifying merchants that they will not receive freight until further notice. This causes some inconvenience, but not so much as it would if trade was active. Business in Shelf Hardware has fallen off considerably during the week. Salesmen are being advised to take their vacations now, and a broad hint is given that they need be in no special hurry to report for resumption of work. Orders are light in every department, but staple goods are decidedly neglected. The Heavy Hardware jobbers are in better shape, having a good steady demand for Iron and Steel, Carriage and Wagon Stock, Blacksmiths' Supplies, &c.

## St. Louis.

(By Telegraph.)

The demand for Hardware shows signs of falling off, and it is expected will continue so during the next two months. Jobbers are carrying full stocks and are in position to ship promptly. Just now the demand runs largely to hot weather goods and staple lines. Jobbers are anticipating a heavy increase in trade after the summer months are past. Crops are in good shape throughout the West and promise to be good throughout the entire country. Prices in nearly all lines are unchanged. At the conference of the Shovel manufacturers held at the Waldorf Hotel, New York, last week an advance in prices was agreed upon. The conference was attended by 15 manufacturers. The only disquieting feature of the present situation is the railroad strike which is now in progress. Railroads are unable to move freight and shipments are at this writing from four to six days behind. The river is being used to advantage and river points have no difficulty in procuring goods, whereas interior towns are likely to be put to considerable disadvantage. Collections are in good shape.

## Cleveland.

**THE W. BINGHAM COMPANY.**—The ending of the first half of '94 is characterized by about the same state of trade as was its beginning—there is positively no life to it. Prices are, if anything, weaker than they were in January. Both manufacturers and jobbers seem to be imbued with the absurd idea that they can stimulate trade by cutting prices, when the facts are that if the goods are not really needed they will not be bought at any price, nor even accepted as a gift if there is any freight attached, as was so aptly illustrated by your corre-

spondent in the last issue on the subject, "When will the bottom be reached?"

The summer months being upon us with the time for the usual vacations, trade will, of course, assume its wonted dullness, but from the middle of August we look for much better business than was experienced last fall. Certainly, it cannot be much worse. Retailers in the city report trade as more than usually dull, although there seems to be a good demand for season goods—Refrigerators, Ice Cream Freezers, Gas Stoves, &c. Collections are fair.

## Boston.

**BIGELOW & DOWSE COMPANY.**—There is but little change to note in the business situation. Prices are ruling very low and dealers are not increasing their stocks. Orders are frequent, but the quantities are small. The volume of business is well up to last year and some houses will report a slight increase in sales. This increase is only made where houses have added new lines and have made an extra exertion to keep them before the trade. The great heat for the past two weeks has increased the demand for Screen Goods and Wire Cloth. The damp weather has made the usual demand for Lawn Mowers, &c. There is one fact that is quite noticeable, and that is the demand for cheap and medium grade goods is far in excess of the higher and better grades. This applies to Lawn Mowers, Bicycles and many lines of Hardware. The whole community seem forced to economize. The opinion is quite general that the passage of the tariff bill, notwithstanding its many bad features, will benefit general business. The real effect of the depression in business did not reach New England so that it was noticeable until July of last year. The prospects are for a much better business this summer and fall, and there are good reasons to expect a considerable increase when comparisons are made. Collections are not quite up to the standard.

## Philadelphia.

**SUPPLEE HARDWARE COMPANY.**—Trade conditions continue about the same as when we last wrote. Salesmen are naturally at home for the Fourth of July holidays. There are always a few days around the Fourth of July when people are not desirous of placing orders for Hardware and would rather not see salesmen; consequently, a dull week for the first week in July may be looked for.

The home force of the various houses has been divided up for their vacations and there will be a general quiet appearance around the business houses of our city for the next ten days, after which we hope for improved trade.

While the above shows no improvement in business, there was an improvement in the business sentiment over two weeks ago, but the recent railroad strikes have again shattered the confidence of persons to some extent.

There is no change in collections from our last report.

#### Baltimore.

**CARLIN & FULTON.**—With many houses the month of July begins a new fiscal year and the experiences of the one just ended, it is to be hoped, will never be repeated in the history of this country.

We have gone through the troublous times of a financial panic, are now about to see the termination of the tiresome tariff discussion and the inauguration of a new policy in that direction, and the business world had counted upon a rest from strife and contention and looked forward to a reaction from the stagnation which has been prevailing so long, when now another element of discord appears, and organized labor threatens to continue the troubles, and by gigantic strikes disappoint, at least for a time, all hopes for better things.

After the failure of the coal strike to accomplish what it had endeavored and the immense loss to all, both employers and employed, in wages and profits, it seemed hardly possible that immediately would ensue another strike of the proportions of the present one, and almost entirely what is called a sympathetic one, there being no dissatisfaction on the part of the railroad employees, but merely an effort by them to compel a manufacturing concern to pay their men more wages.

When the great complaint at the present time is that money is idle and held in the vaults of the great money centers of the world, how is it possible, with these repeated disturbances throughout the country, to induce capital to make investments in corporate stocks, or develop new enterprises and give employment to the masses, when there seems no security for the investments, no possibility for dividends, no ability to control the management of the business created by the money furnished, and the certainty that mob law will arbitrarily dictate and enforce, when possible, the demands, whether reasonable or not, of those whose passions are inflamed and excited by their own salaried officials, who issue their decrees as arbitrarily as any titled despot ever did?

Trade continues quiet, though we expect nothing else at the present time. Orders are confined to merely what is necessary for the daily wants, which, with the low prices for everything, keeps the volume of business from reaching the figures of former years.

Collections are fair, but from our far Southern country we get but little at the present time of the year, the merchants stating that their cash necessarily goes for the purchase of food supplies.

In regard to prices there is but little to note, the probable effects of the tariff, we think, having been pretty well discounted.

#### Portland, Oregon.

**CORBETT, FAILING & ROBERTSON.**—The waters have subsided and everybody is busy getting cleaned up and stocks back in position.

The Hardware jobbers were all in the flooded district, but with the warning they received in advance were able to care for their goods, so that losses are far less than would be imagined by those whose information is derived from the press dispatches.

Trade was for a few days wholly at

a standstill, but by using boats in place of trucks and drays we managed to do our shipping, and, if railroad traffic had not been in a measure paralyzed, would have kept up pretty well with our orders.

Business is fair and demand for goods in the interior increasing.

#### New Orleans

**A. BALDWIN & Co.**—There is at the present time no particular improvement to report in any line, business continuing very quiet. We anticipate a better trade in July and observe some little indications of it already.

#### Omaha.

**LEE CLARKE-ANDRESEN HARDWARE COMPANY.**—The actual business situation, as concerns Omaha, has not changed very materially since our last report. Business still continues of very fair proportions. Heavy rains have fallen in most parts of the State and crops are reported to be in prime condition. Some few localities are still needing a little more rain, but the State as a whole is in excellent shape.

There has probably never been a time when the outlook for an abundant corn crop was any better than at this present stage of its growth. As a result country merchants are expressing more confidence in the future of trade than at any time before since the commencement of the year.

No one anticipates any great rush in business, as trade will undoubtedly remain rather quiet so long as the general conditions prevailing in the country at large are so very unfavorable. The failure of the partial resumption of work at the coal mines to bring about a revival of manufacturing industries, and the continued exports of gold, have been causes of disappointment to the whole country.

What the jobbing Hardware trade do expect is a continuation of the present good steady trade, which they are now enjoying, followed by a brisker demand when the corn crop is secured.

#### St. Paul.

**FARWELL, OZMUN, KIRK & Co.**—July 1 finds us facing new difficulties. The money just closing has been one of comparative calm, inasmuch as we have been allowed to receive goods into our house and to ship them out to our customers in moderate quantities at a fair percentage of profit without inconvenience. The present strikes are quite likely to shut off these privileges, and thus annoy greatly our many good friends in country towns who look to us to supply them with goods in season. It is difficult to explain to a customer, who must supply many Hay Forks to his customers in the immediate future for immediate use, that because Mr. Pullman will not do this or that he himself must lose the sale of so many Hay Forks. We hope the strike will be short lived, for it affects the interests of too many for the doubtful good of a few.

Anxiety with regard to drought has in many sections been entirely removed in the past ten days. Many sections give promise of excellent returns in the fall. We would have no fear of not having a good profitable trade during the remaining six months of the year were it not for the unusually volcanic relations which exist between laborers and their employers. We regard this element of the situation of more moment than legislation in Washington.

Collections continue very fair. Prices as a rule show little inclination to advance. Even now we are occasionally startled by figures which break all previous records. It will be some time before orders can be placed with positive certainty that the bottom has been reached.

#### Louisville.

**W. B. BELKNAP & Co.**—Just as the coal strike is fairly disposed of and we are congratulating ourselves that industry in that important branch is resumed, the railroad employees in the West conclude they can afford to take an indefinite holiday, even at the expense of losing their good positions, and proceed to tie up the roads, one after another, at the command of President Debs. This is extremely unfortunate for the country, as it keeps business and values unsettled and tends to destroy confidence, that important factor in all things commercial and financial. It keeps men out of employment who would otherwise be employed, since no investor wants to undertake new enterprises when an irresponsible third person can destroy in a moment the results of his patience, his thought and labor.

It is a singular state of affairs, and certainly affords the student of political and social economy plenty of material for consideration, inasmuch as these railroad men had no grievance whatever. There was no complaint that hours were too long, or work too hard, or pay too small, but as we understand it, because a factory near Chicago refuses to run on a certain wage scale deemed by those best qualified to know to be out of proportion to the demands of the times, the traveling public, freights, perishable and otherwise, and even the United States mails must be delayed until this little center of dispute ceases to be agitated, or until the heads of certain presidents shrink to their normal size. As an example of how well to do the laboring classes are, "General" Kelly and his tramp army are said to have carried away from here, last week, \$2500, raised, with no effort to speak of, from the labor organizations. No money was contributed by the municipalities of Louisville, New Albany or Jeffersonville.

The fact is, there is comparatively little acute, positive suffering made manifest, and has been very little here at any time within the past year. Exceptional cases, mainly from those who have drifted into town recently under the notion that they would be cared for by the charitable institutions, are the ones heard of most, and relief has been almost immediate on their being published.

For the last 10 or 15 years at least, the drift of population has been toward the large cities. The effect of reduced demand for common labor within cities will surely be to compel this surplus population to seek the country again, where they can at least make a certain living by cultivating the soil. They may have to forego the variety shows in the evenings, but they can be very sure of their bread and meat the next day. Another effect noticeable, we think, is the additional reliance of the individual on himself and his own efforts. Heretofore it has been extremely difficult to have any little job of construction or repairs done without extravagant cost. Now many men formerly gathered under contractors have been thrown upon their own resources and are working for themselves, so that smaller contracts and

agreements are made between the actual consumers and the workmen, resulting more satisfactorily to both.

The prosperity of any community is in no small degree dependent upon its multiplication of small industries, repair shops, journeymen workers, &c., and the day of small things is a thoroughly respectable period of time.

Many mills hereabout announce their intention of closing down July 1, but are very non-committal about how long they will stay closed down. It is tolerably evident that there will be some effort toward the readjustment of the sheet mill scale at least.

An agreeable local feature of the past week was the meeting at the Galt House here of manufacturers in several lines—viz., Plow Goods, Steel Goods, Hames and Chains—with a committee from the Southern Hardware Jobbers' Association and some of our local houses. A drive to Cherokee Park and a subsequent dinner at the Pendennis Club, where there was a felicitous interchange of compliments, made the afternoon and evening of June 26 a date to be pleasantly remembered.

### Notes on Prices.

**Wire Nails.**—The volume of business, as is to be expected at this season, is small and the mills are all of them either diminishing their output or shutting down altogether for a few weeks. Notwithstanding the limited demand the price is firm, and manufacturers who a short time ago were quoting \$1.05 for carload lots at mill have withdrawn this figure and the market is now represented by the quotation of \$1.10, which is firmly adhered to. Small lots from store in New York are held at \$1.25 to \$1.30.

*Chicago, by Telegraph.*—Very little is doing by either manufacturers or jobbers. Prices from factory are maintained at \$1.20 to \$1.25, Chicago. Jobbers quote \$1.25 on small lots from stock.

**Cut Nails.**—There has been little change in the Cut Nail market during the past week. The quantities are small, but the mills have no large accumulations of stock on hand. The price for carload lots delivered on dock in New York continues at 95 cents to \$1, the former figure being in most cases readily obtainable. Small lots from store in New York are held at \$1.10 to \$1.15.

*Chicago, by Telegraph.*—Trade is light and factory prices are unchanged at 95 cents, Chicago, on 55-cent average. Jobbers sell small lots from stock at \$1.15.

**Barb Wire.**—There is little doing, and prices remain without change, being somewhat uneven, but manufacturers are not attempting to force sales. The market is represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, \$2.05 to \$2.10; Cleveland, \$2.10 to \$2.15; Cincinnati or Allentown, \$2.25 to \$2.30; Chicago or New York, \$2.25 to \$2.30.

*Chicago, by Telegraph.*—The movement is very light at present, but manu-

facturers seem to be making no effort to push sales. Jobbers quote small lots of Galvanized at \$2.35 to \$2.40, with 10 cents off for carloads.

**Cordage.**—The manufacturers of Cordage have made another advance and are now quoting as follows:

	Base. Cents.
Manila.....	7½
Sisal.....	5½
New Zealand.....	5

There is, however, only a moderate business at these figures, the jobbers being generally in a position to furnish Rope at somewhat lower prices. The market is characterized by a firm tone.

**Keystone Leather Dog Muzzle.**—This article was described in our last issue. It is put on the market by the Keystone Dog Collar Mfg. Company of 505 Commerce street, Philadelphia. The Muzzle is offered in three sizes, Nos. 1, 2 and 4, which are listed respectively at \$3, \$3.50 and \$6, these prices being subject to a discount to the trade of 60 per cent.

**Chisels and Drawing Knives.**—The manufacturers of Chisels and Drawing Knives have recently been conferring with a view to reaching an understanding for the better maintenance of prices. As a result, while no important change was made, some extreme quotations have been withdrawn and the market is characterized by a somewhat better tone. Among the manufacturers represented were the following: Peck, Stow & Wilcox Company, C. E. Jennings & Co., Winsted Edge Tool Works, Ohio Tool Company, G. I. Mix & Co., and Sag Harbor Tool Company.

**Copper Wire.**—For some time past there has been a demoralization in price of Bare and Insulated Copper Wire. Manufacturers of these goods at a recent conference decided to maintain prices on a somewhat higher level, and in consequence some advances have been announced.

**Glass.**—Activity among the Window Glass factories of the country ceased June 30, as the fires were put out of blast for the summer. It is conceded that stocks of Glass in first hands are less than for many years at the time of the annual shut down, the amount of Glass at present being estimated at 1,000,000 boxes. Manufacturers usually expect to have an accumulation of Glass for the summer and early fall trade, varying from 2,000,000 to 4,000,000 boxes. It is reported that about 100,000 boxes of foreign Window Glass is now in bond awaiting the settlement of the tariff question before the duty is paid. Pittsburgh factory quotations are reported as being from 80 and 10 to 85 per cent. discount, much depending upon the desirability of the order. Orders for Plate Glass are reported plentiful at all the factories now in operation. Quotations are given as 70 per cent. discount for sizes 5 feet and over, and 70 and 10 per cent. discount for sizes 5 feet and under, for New York and New England, on the Eastern list. For the West quotations are reported as 70 and 5 per cent. discount for sizes over 10 feet, and 60 and 20 per cent.

discount on sizes 10 feet and less, on the Western list.

### The Hardware Club.

**THE COOLNESS AND AIRINESS** of the Hardware Club's abode have been fully appreciated by the members and their guests during the sultriness and heat of the past few weeks. The favorable expressions from all quarters concerning the premises continue to demonstrate the wisdom shown by the management in the development of their plans. One member, peculiarly sensitive to heat, remarked the other day, when it was extremely hot, he was convinced the atmospheric conditions had changed while he was dining, but on reaching the street after the meal he found it as warm as ever. Another individual who entertained a member of his family at dinner Saturday, June 23, said to be the hottest day of the year, was compelled to weight down the linen to keep it in place, in consequence of the strong breeze. A veteran club man of much experience in social organizations, of several of which he is a member, asserted recently that although belonging to another dining club in this city, having a full complement of 1000 members and a waiting list, with all expenses very much higher, the accommodations in every respect were better at the Hardware Club.

At a meeting of the Board of Governors held June 28 the following gentlemen were admitted to membership in the Hardware Club:

Hon. Phineas C. Lounsbury, president Merchants' Exchange National Bank, New York.  
E. P. Stoughton, Millers Falls Company, New York.  
Walter L. C. Glenney, G. I. Mix & Co., New York.  
Charles R. Browning, American Wringer Company, New York.  
F. T. Luqueer, Jr., R. S. Luqueer & Co., New York.  
Willard L. Candee, New York.  
J. Newton Vanness, J. Newton Vanness Company, New York.  
Joseph W. Stover, Gamewell Fire Alarm Telegraph Company, New York.  
Edward W. Harral, Fairfield, Conn.  
George H. Webb, Pawtucket Mfg. Company, Pawtucket, R. I.  
Samuel C. Beckwith, Tribune Building, New York.  
Edwin H. Brown, Postal Telegraph-Cable Building, New York.  
Henry C. Bryan, 99 Nassau street, New York.  
Carl N. Greig, New York World, New York.  
Hugo Hohenstein, 31 Warren street, New York.  
Dyer B. Holmes, American Investment Union, New York.  
Maurice J. Powers, United States Shipping Commissioner, New York.  
Edward V. Skinner, 353 Broadway, New York.  
Frederick Hart, Poughkeepsie, N. Y.

The increased attendance at the club, the spirit of fraternity which is manifested and the number of out of town merchants and manufacturers who visit the rooms are pleasant features which indicate the position the club has established for itself.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### Is the Discussion of Trade Abuses Desirable?

The following letter brings up the question whether the discussion of certain trade practices which are subjected to criticism does not tend rather to advertise than to correct them:

I have noticed in your columns of late considerable discussion by jobbers of the direct dealings between manufacturers and retailers, and of syndicate buyers and their methods, and it seems to me that the publicity given to the subjects mentioned is harmful to the interests of the jobbers. It simply advertises the fact that direct dealings between makers and retailers are becoming more general and that the retailers, as well as the jobbers, can derive a benefit from syndicate buyers. Retailers of the better class will be all the readier to write direct to the factories for prices when they find that the factories generally will quote, and the manufacturers will be the quicker to name prices when they become assured that the practice of direct dealings is followed by other manufacturers, and they will not be made unpleasantly conspicuous by selling direct; and the jobbers by their interference will be regarded as more of a hindrance to trade than a promoter of it. The jobbers can work better if they do it quietly, and some concerted action can be taken without publishing the facts to their own confusion.

There may be some force in the position thus clearly stated by our correspondent, and perhaps something would be gained by keeping from the trade information of which they might make use in the manner indicated, but on the whole, it is certainly best that the merchants should be informed in regard to tendencies in the trade, the way things are going and what people are talking about. The best policy is to let in the light on such practices as are under discussion. If they are desirable and in accordance with the laws of trade they will continue in spite of any policy which may be adopted to repress them, but if not, a thorough discussion will help to correct the evil.

### Does it Pay for Retailers to Be Yielding in the Matter of Prices?

This question is thus discussed by an Indiana Hardwareman:

An old dry goods dealer taught me a lesson very early in my Hardware career. I had been in business about six or eight months and needed quite a lot of dry goods for my own home. The bill came to \$12.23. "Call it \$12," I said, laying down that amount. "I can't do it," he said. "You can't?" said I. "Why, I treat my customers more liberally than that!" "Yes," said he. "I have heard that you did, and you are educating them to expect it on every sale. It's just as you educate your trade, but you will find that it is a poor plan in the long run."

When I went out I began to

think of this. I had thought nothing heretofore of throwing off odd amounts, but the more I considered it the better convinced I was that the old man's way was the wiser one. Just then a rich and stingy old farmer came in and wanted a Hatchet. My price was 85 cents. "You can make this 75 cents," said he. Half an hour before I would have said, "All right, Mr. Brown, seeing as it's you, I'll make it 75 cents." But now I said: "No, I can't sell it for better than 85 cents. It is a warranted Hatchet, and 85 cents is cheap for it." I was afraid he would go out, and if he had I think it would have given my new resolutions a nip in the bud, but he didn't. He said, "Wrap it up," paid 85 cents, and appeared perfectly satisfied.

"See that," said I to myself after he had gone, "I made a sale, got my full price, and I honestly believe Brown is better satisfied with his purchase than he would have been if I had thrown off the 10 cents. I'm going to go on this line hereafter." And I did, except on very rare occasions. It made quite a difference in my profits in the course of a year, and my trade appeared to think more of my word. I owe the old dry goods man a large measure of gratitude.

### Replies to Inquiry.

The question referred to in our last issue under the heading of "Should They Receive the Letter?" was referred to the Post Office Department. The official reply is to the effect that letters addressed as in the case in question "with the name in the lower left hand corner of the person supposed to be buyer of that concern are deliverable to any member of the company or firm. If some other person has succeeded to the office of buyer than the one whose name appears on the envelope the letter should reach that person." The department, however, suggest that the words "For the Buyer" instead of a name should be used for the sub-address.

Referring to the same matter a well-known manufacturing concern write:

We note your inquiry on page 1259, third column, and would say that we believe the letter should have been opened as the property of the firm. We do not hesitate to do it.

### Is the Jobber Necessary?

BY AN OLD JOBBER.

I am much interested in all the papers *The Iron Age* has given us from the Southern Hardware Jobbers' meeting. They are all practical and upon exceedingly live topics, but I want to make a few comments now upon the papers upon "Manufacturers and Their Relation to the Trade."

For 30 years past, in my own experience, there has been constant

#### COMPLAINT AGAINST MANUFACTURERS

for not confining their sales exclusively to the wholesaler, who in turn should

sell only to the retailer, and he be given all the trade of the consumer.

This complaint evidences the trouble, but it has not as yet produced any remedy. The evil of manufacturers selling to retailers, if it is an evil, has steadily increased and was never, in my experience, so bad as it is to-day.

Can it be remedied?

I do not think it possible.

Is it an evil?

To the jobber, Yes; to the country as a whole, No.

#### IS THE JOBBER NECESSARY?

To my mind the conclusion has forced itself that the jobber is not a necessity in the trade. He has been a very great convenience, but his place in the business world is of vastly less importance than it was a quarter of a century ago.

I have seen a constant tendency to closer relations between the manufacturer and the retailer. I believe these will continue to move nearer each other, and the time will come when the retailer will do most of his buying direct from the manufacturer.

Can the jobber stop this tendency?

I do not think he can.

There are several things that combine to bring this about.

One is, the retailer is each year a better posted man, both as to who makes goods, where they are made, and what is the factory price. This is partly due to trade papers, and also to the greater diffusion of general intelligence.

The second reason is, the keener competition in trade and the departure of the era of high wages, high interest and large profits. The world is coming down to a smaller scale of wages, of incomes, of profits. This necessitates keener buying, and the making the most of one's opportunities. One of the greatest opportunities of which to avail oneself will be saving the jobber's profit and buying direct from the maker.

The third reason for the retailer and the manufacturer drawing nearer is because of superior freight facilities and very low carrying charges.

When it required four weeks to get goods when ordered by a dealer in Indiana from a Connecticut factory, and freight rates were three times what they are to day, there was no opportunity of the two places doing business together, but this has been changed. The dispatch lines carry freight from Meriden, Conn., to, say, Marion, Ind., for about the same rates as from Indianapolis.

#### THE JOBBER A TAX.

I trust I am not copying the parrot when I say that the jobber is a tax upon every retailer, or if not upon the retailer then upon the manufacturer, and in either case his removal would inure to the advantage of the retailer.

The jobber is located in a large city. Everything he uses is expensive—rents, clerks, salesmen, insurance, taxes—everything. He is not an assistant of the manufacturer; he is a competitor.



## MANUFACTURERS AND JOBBERS.

Where he finds the retailer buying an article at a low price of the factory direct he at once demands a lower price, that he may take this trade to himself, a trade he has not made and cannot control.

The jobber has not assisted manufacturers of new lines in introducing their goods. His ordinary position is one of antagonism to these, but when the manufacturer has secured a market for his wares the jobber is ready to appropriate it and demand "protection" in his profits.

That this is true, go back in your mind to the introduction of Diaston's Saws, American Table and Pocket Cutlery, &c.

## THE RETAILER.

The machinery of business is determined to simplify itself. Just as the consumer is constantly reaching out to buy of the jobber, so the intelligent retailer tries to buy of the maker.

We have tried to throw him off the track by using our own labels on the goods we sell, lest he learn the maker's name and write to him for prices.

We have tried to frighten the manufacturer by agreeing to throw out his goods if he sold the retailer.

But the intelligent retailer "caught on" to the makers' names of goods we sold under our own brands, and this has not accomplished what we hoped. So we have found that we could not order goods from every manufacturer in every line, and those from whom we did not buy were, necessarily, but little frightened by our threat to withdraw trade.

## A QUESTION.

A straw that shows the opinion of jobbers upon this point can be found in the fact that very few jobbing houses are not to-day retailers as well. Where is one in Buffalo, Pittsburgh, Cleveland, Toledo, Detroit, Indianapolis, St. Louis, Chicago or St. Paul that will not sell any man a bill for trimming his house? If one, he is an exception.

Most of the jobbers have a large home retail trade, very few of them have the local retailers' trade. Men do not buy of their competitor.

## CONCLUSION.

No, "you may resolutely till the cows come home," as was remarked by that patriotic Illinois man in John Hay's famous poem, but it will accomplish nothing. "The stars in their courses" are fighting against the jobber, because the jobber is not a necessity, and because his profits to a very large extent are a tax upon the profits that should belong to the retailer.

Who can contradict this?

S. A. HAINES, who has been spending a week or two in the East, sailed on Wednesday for England and the Continent in the interest of the Eclipse Bicycle Company. He expects to be absent for about seven weeks. The business of the S. A. Haines Company, at Indianapolis, will go on as usual under the direction of H. C. Newcomb.

## Personal.

**NORTHAMPTON CUTLERY COMPANY**, Northampton, Mass., announce that their export business, heretofore conducted by F. J. P. Tompkins, deceased, will hereafter be transacted through their New York office, at 122 Chambers street, in charge of H. B. Titus.

**GEORGE A. HAMILTON**, who for nearly 30 years has traveled for Russell & Erwin Mfg. Company in Northern territory, is now in town and is among the list of those visiting the apartments of the Hardware Club.

**PAUL R. HARWOOD**, Norfolk, Va., jobber of Hardware, Wood and Willow Ware, is now in New York.

**J. M. TILLOTSON** of the Russell & Erwin Mfg. Company, with headquarters in St. Louis, has recently been in New York.

**R. L. DORSEY** of the Tucker & Dorsey Mfg. Company, Indianapolis, Ind., while on a visit East was entertained by the company's New York agent at the Hardware Club.

**ROBERT R. LEEDS** of South Evanston, Ill., who represents Russell & Erwin Mfg. Company, and T. D. Peck, salesman for Russell & Erwin Mfg. Company, with headquarters at Galesburg, Ill., have been registered as visitors at the Hardware Club.

A SELECTED TEAM from Sargent & Co., New York, left here July 3 for New Haven, Conn., where they are to play a game of baseball with a team consisting of factory employees of the company.

**T. BICKLE**, a mining engineer of London, who has been in Mexico for the past two or three years on professional business, is a visitor at the Hardware Club. After spending a year in England he will return to Mexico. While here he will execute a commission to purchase some Builders' Hardware to be incorporated in new buildings in Mexico.

**W. T. KELLOGG**, manager Empire Forge Company, Lansingburg, N. Y., while in town recently was a guest at the Hardware Club.

**ALBERT FLAGLER**, well known as a Hardwareman of long experience, formerly of Walsh, Coulter & Flagler and other concerns since their time, is now located at 85 Chambers street, New York. He is doing a Government business mainly with the United States Navy, as he has been doing for some years. He is transacting it now through Patterson & Harral, in whose store he has accommodations.

**S. P. JENNINGS**, New Castle, Ind., manufacturer of Axe, Pick and Sledge Hickory Handles, has in connection with his present business gone into the manufacture of Elm Coil Hoops for cooper, sugar house trade, &c. This feature of the business will be done under the name of New Castle Coil Hoop Company. W. H. Quinn & Co., 103 Chambers street, New York, are the New York agents.

## Requests for Price-Lists, Circulars, &amp;c.

A NEW HARDWARE FIRM is that of Maslin, Wayland & Coiner, at Waynesboro, Va. Mr. Maslin was formerly connected with the Maslin & Booker Hardware Company of Staunton, Va. The new firm are in the market for a full line of Hardware, the intention being to actively commence business in two or

three weeks. They will doubtless be glad to receive price-lists, catalogues, circulars, &c., pertaining to their business.

**H. F. FRASSE**, 19 Warrenstreet, New York, advertises that he is in the market for job lots of Hardware of good quality, such as Hatchets, Saws, Pad Locks, Bicycle Bells, Screw Drivers, Hand Saws, Coppers and any goods of analogous character, for which he will pay cash.

## Mississippi and Missouri Valley Hardware Association.

THE ANNUAL MEETING of this association will be held at the Hotel Lafayette, Lake Minnetonka, Minn., the opening session occurring on the morning of the 10th inst. The meeting will be continued on the 11th and possibly may not be concluded until the 12th, the duration of the meeting being dependent on the number of papers presented, discussions, &c. The indications are that the meeting will be an interesting and successful one, and that a number of matters of importance will come up for deliberation. The association comprises 26 houses, every one of whom will be represented at the approaching gathering.

## Findlay Rolling Mill Company's Catalogue.

FINDLAY ROLLING MILL COMPANY, Findlay, Ohio, issue a well arranged and finely printed catalogue, illustrating with prices the lines of goods manufactured by them. A view is given of their office and extensive works, followed by illustrations of a variety of styles of single and double bit Axes, printed in colors; Ship, Carpenter and Railroad Adzes; Broad and Bench Axes; Shingle, Half, Lath and Claw Hatchets; Hazel Hoe; long and short cutter, Pick, Brush and Ore Mattocks; Coal Wedge; Coal, Stone, Railroad, Tamping, Quarry, Surface, Drifting and Poll Picks; Pick Eyes, Grub Hoes, Sterling Coil and Cable Chain, Log Chain, Chain Dog, Cable Chain Shackle and Ring Dog. The catalogue is provided with a convenient index, and an exhaustive telegraph code, covering questions pertaining to purchasing, answers pertaining to purchasing, ordering phrases, questions pertaining to shipments, answers to orders and shipments, terms, time, sizes, weights and quality, and discounts. The company remark that in this catalogue they have endeavored to faithfully illustrate their new tools more in keeping with their present style of business, which has outgrown their former illustrated lists. They state that they also manufacture various other styles of tools, not illustrated or carried in stock, on which prices are quoted on application; and that their experience in the past ten years is proof to them that they can safely guarantee their goods, in point of quality and finish, as equal to any in the market.

**CHARLES H. PARSONS**, New Britain, Conn., one of the directors of P. & F. Corbin, while in New York a few days ago, was entertained by the company's New York manager, Wm. Bishop, at the Hardware Club.

## Arrangement of Stores.

JOHN B. VARICK COMPANY.

JOHN B. VARICK COMPANY, Manchester, N. H., have replaced their former store building, which was destroyed by fire, by a fine five-story building having a frontage of 37 feet and a depth of 100 feet. This, in addition to a four-story warehouse, is

is provided with a Corbin solid bronze pull, while all boxes wider than 6 inches have two pulls. The samples are fastened on with copper wire, sheet brass cut into strips and with blind staples. Provision has been made for marking the prices of goods contained in these boxes by a convenient arrangement. On the right hand side of each box a slot has been cut the entire length—not including

used as a general storeroom, in the rear of which is a machine shop where Bicycles, Firearms and Sporting Goods are repaired. Oils, Paints, Cordage, Glass, &c., are kept in the well lighted basement. An elevator operated by electricity runs from the basement to the top floor. The adjoining warehouse is used for heavy and bulky goods. The entire floor space, including the warehouse, occupied by the firm is about 40,000 square feet, and 40 employees are necessary to carry on the business.

## Trade Items.

HENRY R. TOWNE, president of the Yale & Towne Mfg. Company, went to Europe on the "Augusta Victoria," June 28, on a pleasure trip. He expects to return late in September next.

THE SPECIALTY MFG. COMPANY of Hartford, Conn., will hereafter conduct their business under the title of the American Specialty Company. This change in style has been made necessary by the fact that a couple of days prior to the organization of the company, and unknown to them at that time, another company in the State filed a certificate of organization under the same title as theirs, which under the laws of Connecticut gives them sole right to its use. It is accordingly requested that hereafter all communications be directed to the American Specialty Company.

THE BUSINESS of Pauls Brothers, 88 Chambers street, New York, manufacturers and importers of Cutlery, is being continued under the same name. The firm now consist of Albert Pauls and Edward Weck, August Pauls, the head of the concern, having died within the year. The junior partner has always been in the Cutlery business and has had much experience. The firm continue the manufacture of the Vulcan Knife Company's Patent Scale Pocket Knives at their factory in Morton street, Brooklyn, where, with their present facilities, they have a capacity of 800 dozens a week.

H. M. KLEPPISH, who deals in Cutlery and Hardware Specialties, has moved from 100 Chambers street, New York, into more commodious quarters at 98 Duane street. He now has the loft until recently occupied by the estate of John A. McKinless, the remaining portion of which stock Mr. Kleppish has purchased. We are advised there are many jobs still left of desirable goods which can be bought satisfactorily. Especial mention is made of a stock of English Steel Split Rings, aggregating some thousands of grosses, from quite small sizes up, orders for which have been liberally given, we are told.

CHARLES F. WIEBUSCH of Wiebusch & Hilger, who is now in Europe on a business trip, is expected back in this country some time in August next.

THE VAN WAGONER & WILLIAMS COMPANY, 14 Warren street, New York and Cleveland, Ohio, are now the sole manufacturers of the Excelsior Damper, until recently made by the Shepard Hardware Company, Buffalo, N. Y. It is referred to as being well made, reliable and simple in construction, the castings being extra smooth. The handle is jappanned, and being ventilated, remains cool. There are no springs to burn out or have their temper drawn by the heat. This company are also making the Dome Sad Irons formerly made by the Shepard Hardware Company.

THE UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., in a

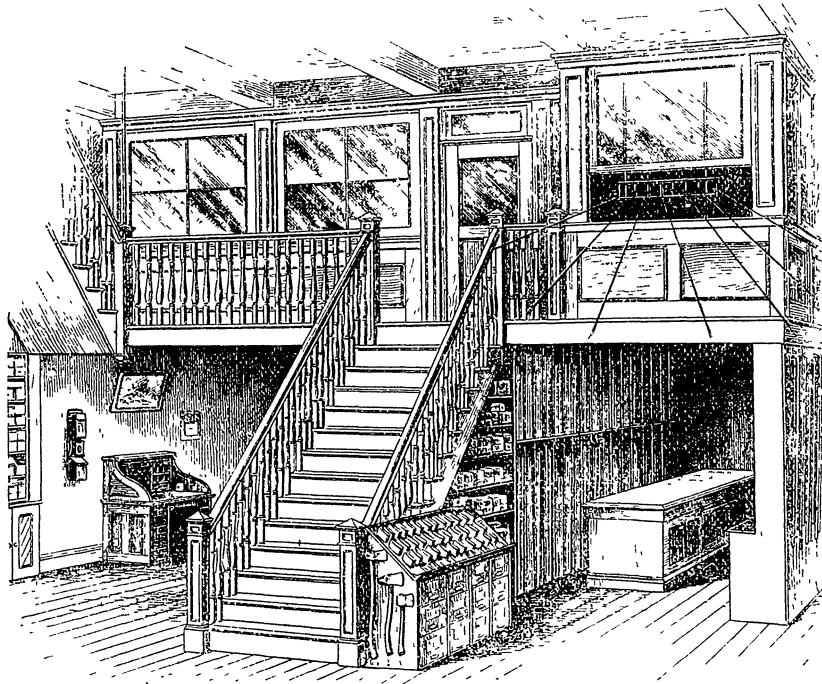


Fig. 857.—Elevated Office.

required for their business. The first floor of the store is used as a general salesroom and is provided with traveling ladders, cash carriers and other modern conveniences. On this floor are 2950 shelf boxes or drawers, all sampled with shelf Hardware. The fronts of the boxes are of white wood, finished with three coats of hard oil finish. The shelving devoted to the

the face—2 inches wide and  $\frac{1}{8}$  inch deep. In this slot a piece of cardboard is fastened with  $1\frac{1}{2}$ -ounce tacks, and the marking of prices, numbers, &c., is made on the cardboard. Changes in price are thus easily made, or new cardboard can be substituted at any time.

The first story of the office is shown in Fig. 857, the office, however, being about 19 feet high and extending to the ceiling of the second floor. Excellent light and good ventilation are secured from windows in the rear. The cash carrier station is shown at the right. Under this accommodations are provided for retail stock of Glass, Nails, &c. On the opposite side the space is utilized as an office for entry clerks, &c. At the foot of the stairs on the right hand side is an Axe rack, a larger view of which is given in Fig. 858. Wooden pins are arranged in rows, upon which the Axes are suspended. This is referred to as being a very successful arrangement, showing the Axes to good advantage and being economical of space.

The second floor is devoted to Sporting Goods, including a large display of Bicycles, Fishing Tackle, Guns, Base Ball and Tennis Goods, &c. On the third floor is duplicate Hardware stock in original packages, from which the stock on the first floor is replenished. The agricultural department occupies the fourth floor, while the fifth floor is

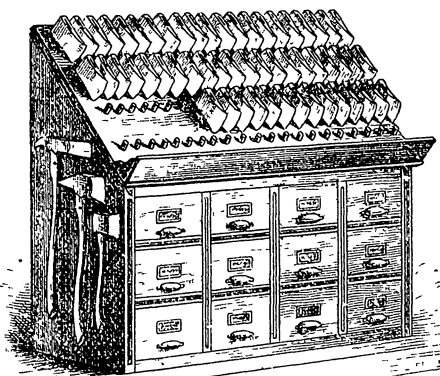


Fig. 858.—Axe Rack.

boxes is 30 inches wide and runs to the ceiling, 13 feet 4 inches. These boxes occupy the entire length of the store on one side. The boxes are all 16 inches deep, 6 inches high and vary in width from  $4\frac{1}{2}$  inches to 21 inches, according to the goods which they contain. Each box 6 inches in width

recent circular to the trade direct special attention to their line of Paper Shot Shells, among which are the Trap Improved, with a metal outside reinforce; the Smokeless Improved, which has a longer metal outside reinforce than the Shell heretofore made. The Trap is of a green color and the Smokeless salmon color. Both have No. 3 primer and battery cup. They also have the new Walsrode and Black Club, the former designed for any proper charge of Walsrode powder and the latter for black powder, with No. 2 primer. The Nitro Club, another of the new line, has a long head, specially constructed base, and has new No. 4 primer. These Shells are variously suited to black and nitro powders.

THE PECK STOW & WILCOX COMPANY, 27 Chambers street, New York, are now offering their Bicycle Wrench recently brought out in another finish. The Wrench, after being finely polished, is blued, giving it a fine appearance and adding much to its salability. It will be known as No. 7 to distinguish it from the No. 5, which is nickled. Both are put up in separate telescopic pasteboard boxes.

REV. W. C. BITTING of Mount Morris, N. Y., was one of the recent visitors to the Hardware Club. Mr. Bitting will be remembered by those present at the last Hardware dinner at Sherry's, February 23, 1893, as responding to the toast, "Tubal Cain's Place in Life." The rapidity with which he delivered his admirable address, which was largely humorous, caused the knights of the note book to recollect him vividly. It was a stern chase in which he was not overhauled.

J. R. TORREY & Co., Worcester, Mass., in their advertisement in this issue make a liberal offer to facilitate the introduction of Torrey Strop Dressing. The makers refer to the fact that the Dressing is entirely different from all other preparations of this kind, and that it is this Dressing which has given their Strops the reputation they enjoy. Handsome advertising cards accompany each box, and directions how to sharpen and use a Razor is put up with each package. It will be noticed that a sample dozen will be sent prepaid on approval, and that the retail price of 15 cents is designed to make it a quick seller.

## It Is Reported—

### Arkansas.

That Warren & Boyd are preparing to start a Hardware and general store business at CARROLLTON.

That G. W. Carter & Son, HEARN, have sold out to J. H. Carter.

### California.

That S. C. Wright has purchased the Hardware store of John W. Morrison, SANTA ANA, and is now in possession.

### Colorado.

That the Tompkins Cary Hardware Company, LEADVILLE, will hereafter be known as the Tompkins Hardware Company, the senior member having purchased Mr. Cary's interest. Mr. Cary will remove to DENVER.

### Delaware.

That the store of the Delaware Hardware Company, WILMINGTON, was robbed a short time since of a quantity of Knives and Razors.

### Georgia.

That the Hardware business of B. T. Sinclair & Co., DARIEN, is now being conducted by Richard D. Fox as successor.

### Illinois.

That the Hardware store of M. Hart, MINIER, was robbed on June 17. The

thieves carried off the entire stock of Pocket Cutlery, Razors and Revolvers.

That Spiss & Son of NORTH FULTON, have recently enlarged their establishment until its dimensions now are 25 x 104 feet.

That Hoyt & Reeves of MAPLE PARK have sold their Hardware and lumber business to T. F. Brown.

### Indiana.

That Cyrus C. Nave has purchased the interest of John Provines in the Hardware firm of Dickover & Provines, HUNTINGTON.

### Iowa.

That J. A. Haughes' Hardware store, at BUFFALO CENTER, was destroyed in a large fire at that place on June 17.

That S. C. Corbin of FAIRFIELD has purchased a stock of Hardware and groceries at Tipton.

That J. R. Haviland's Hardware store, at BENTON, was burglarized on June 14.

That W. A. Gardner & Son of LEWIS have sold their stock of Hardware to D. A. Bueckhalter, who will take possession in a short time. Mr. Gardner and his family will remove to California.

That J. M. Farley's store, at WHITEMORE, was burglarized on the 19th ult.

### Kansas.

That V. Goodsheller, Hardware merchant, at CONWAY, has sold out to Jesse Allen.

That Geo. E. Withington of ALLEN has purchased an interest in the Hardware firm of Lanning Bros., EMPORIA.

That burglars secured \$100 worth of goods from O. W. Romig's Hardware store, at FALL RIVER, a few days since.

That A. H. Bartlett has succeeded D. F. Bartlett in the Hardware business at PORTIS.

That the Hardware firm of Dauskin & Eaton, MARION, has been dissolved, J. H. Dauskin continuing.

### Michigan.

That Nathan Kenyon's Hardware store, at IONIA, was robbed on the 20th ult. A reward of \$35 has been offered for the return of the property and capture of the thieves.

That F. M. Wheeler has purchased the stock of Hardware of Wheeler & Lovett, OWOSSO.

That the Hardware store conducted by Blake & Thomas, at GALESBURG, was robbed on the 19th ult.

### Minnesota.

That A. Johnson is the proprietor of a new Hardware store at HAWLEY.

That Southwell & Rushfeldt of HAWLEY have nearly completed their new store. They will open up with a full stock of Hardware and Farm Machinery.

### Missouri.

That William Walpole has opened up a stock of Hardware at CARTERVILLE.

That J. S. Pile has purchased the interest of J. L. Cole in the Hardware firm of J. L. Cole & Son of BETHANY. The firm name has become Cole & Pile. J. L. Cole has retired from the Hardware business that he may give more attention to other lines in which he is interested.

That burglars stole \$100 worth of Knives and Hardware from the store of Stilwell & Co., CARROLLTON, a short time since.

That Fred. Gordon has closed out his stock of Hardware at STOTESBURY.

### New York.

That Alling, Fields & Co., a new Hardware firm, at DUNKIRK, will be ready for business about July 16. They will occupy the store formerly tenanted by P. B. Cary & Co. The new firm will handle a full line of general Hardware, Farming Implements, Tinware, Stoves, Furnaces, &c.

### Ohio.

That Stanley & Cortney of BELOIT have dissolved partnership. Mr. Stanley will hereafter conduct the Stove and Tin business and Mr. Courtney the Implement business.

That the Hardware store formerly owned by Hoopman Bros., POINT PLEASANT, has been moved to Byesville, where it is now conducted under the name of P. H. Hoopman.

### Oregon.

That M. Morrison, Hardware merchant, at DALLAS, is closing out his stock.

### Pennsylvania.

That efforts are being made to close the retail Hardware stores of PHILADELPHIA in the evenings during the months of July and August. The question as it is agitated is to get all the stores to close daily at 6 o'clock, or if that is too much, to find out what evenings are acceptable to retail dealers. Notices have been sent out to every retail dealer, requesting their ideas on the subject. Already there have been numerous retailers who have signified their intention of closing.

That the Pickett Hardware Company of WARREN have closed their store at East Warren.

### Rhode Island.

That the Hardware store of Cyrus Barker & Co., PROVIDENCE, was the scene of a daring robbery on the 22d ult. The burglars secured booty valued at \$300, including Revolvers, Razors, Pocket Knives, &c.

### South Dakota.

That M. Harbert's Hardware store, at MARION JUNCTION, was robbed on the 22d ult.

### Texas.

That S. A. Cherry's Hardware store, at Gainesville, was robbed on the night of the 13th ult. This makes the fourth time within the past year that the house has been the victim of thieves.

### Virginia.

That Maslin, Wayland & Coiner is the style of a new Hardware firm at WAYNESBORO. They expect to commence business in two or three weeks. Mr. Maslin was formerly a member of the Maslin & Booker Hardware Company of STAUNTON.

### Washington.

That C. M. Stephens & Co., in the Hardware and furniture business at Waterville, have been succeeded by E. L. Sessions.

*The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.*

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

**White Lead.**—The irregularity that has characterized values for some time past continues, and while there is no decided change in quotations to record the market is weaker in tone since competition continues keen in all quarters. Business continues to be of moderate volume and the demand is hardly up to the usual moderate volume for this season of the year.

**Red Lead.**—Few orders have been placed for future deliveries and buying interest among large consumers is exceedingly tame, although specially low prices have been made at times to induce purchases. The jobbing movement has been slow and chiefly at former prices.

**Litharge.**—Demand has been low during the week and there is little doing at present aside from the filling of old contracts. Prices are quoted as heretofore and remain rather weak.

**Orange Mineral.**—Fair orders have been placed for foreign brands for future shipment, but the movement is rather below the average. Spot sales have been very moderate. Prices have undergone no change.

**Zincs.**—The chief feature has been the continued free offering of German Oxide for future delivery at comparatively low prices. On round lots 5¢ is a common quotation and a shade less has been named for some shipments. American brands are without change in price and have been selling slowly.

**Colors.**—In the condition of the market for Dry Colors no change has taken place, business being at former prices for the most part and moderate, all told. Oil Colors have met with merely ordinary jobbing sale and prices remain as they have been for some time past.

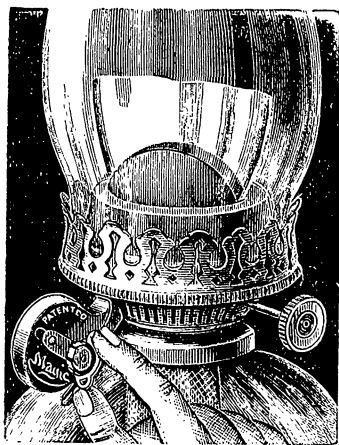
### Oils and Turpentine.

All branches of the market for animal and vegetable Oils have been rather quiet the past week, and no distinctly new features have developed. Prices have undergone hardly any movement, and, with few exceptions, notably Linseed Oil, the leaning is still more or less in buyer's favor.

**Spirits Turpentine.**—Prices have ruled a shade lower, with 30¼¢ @ 30½¢ for regular and 31¢ for machine barrels, the figures on latest dealings. Only routine business has been done.

### Magic Self Lighting Lamp Burner.

The accompanying cut represents a self lighting burner put on the market by the Magic Introduction Company, 321 Broadway, New York. A flat wick burner made to fit different sizes of lamp founts is provided with a lighting attachment containing a roll of tape having a series of igniting pellets at intervals along its surface. One end of the tape runs up and over a roller at the top of the lighter, then down, and is attached to the axle of a turn key outside the burner. When the key is



The Magic Self Lighting Lamp Burner.

turned the tape is moved, bringing a pellet in contact with a steel point at the top of the burner, producing a flash of light, which ignites the wick. When the pellets on the tape are exhausted another tape may be introduced into the lighter. The point is made by the company that the lighting is done without the use of matches, avoiding all danger of burning carpets with match ends.

### Portable Stoop Seat.

The Magic Introduction Company, 321 Broadway, are marketing a portable stoop seat, as shown in the accompanying figures. It is made of what is termed perforated chair bottom. On the bottom and back of the two sections are stout wooden braces hinged, so that when placed in position on the steps of

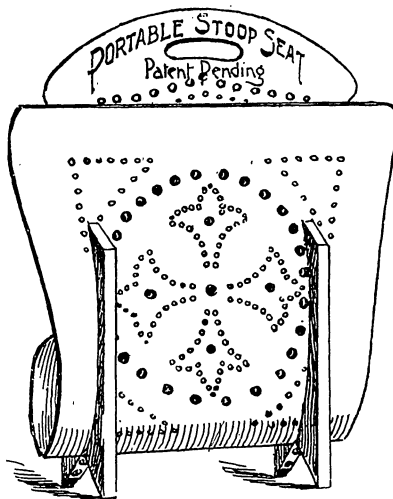


Fig. 1.—Portable Stoop Seat Closed.

a stoop, &c., it takes the place of a chair, ottoman, rug, &c. It is exceedingly light, weighing but 2½ pounds, and occupies but little space. The extreme measurements of the back are 19½ x 14½ inches, the bottom being 13½ inches from front to back and 17½

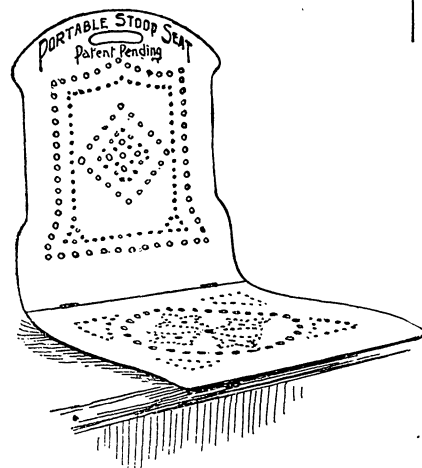


Fig. 2.—Portable Stoop Seat Open.

inches wide. Fig. 1 shows the seat closed for carrying or putting away. Fig. 2 represents it in position ready for use. They are furnished in light colored wood.

### Victor Store Ladder.

Coburn Trolley Track Mfg. Company, Holyoke, Mass., are offering the store ladder shown in Fig. 1. The ladder runs on a hardwood pole extending the length of the shelves by means of a double trolley shown in Fig. 2, consisting of four grooved wheels, two above and two below, gripping the pole between them at either arm of the ladder, thus making, it is stated, a perfect grip holding the ladder rigid when at rest, and insuring noiseless and smooth running. It is explained that the trolley

carriage is so adjusted that the ladder may be set at any angle, as in Fig. 3, and run as well as when perpendicular, and that it can be pushed back close to the shelving out of the way when not in use, as illustrated in Fig. 4. The bot-

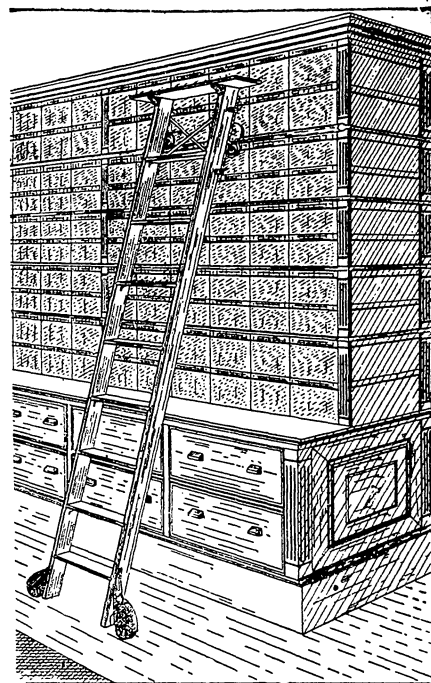


Fig. 1.—Victor Store Ladder.

tom of the ladder is provided with two wheels which run along the floor without requiring a track. The wheels, if so desired, may be set to run along the counter or along the edge of the shelving. It is stated that the ladder has

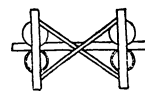


Fig. 2.—Victor Carrier.

anti-friction roller bearings throughout, and that it is made in the best manner. The manufacturers claim that the device requires no adjustment; that it need not be oiled; that it is easily put up; that it is light and strong, and

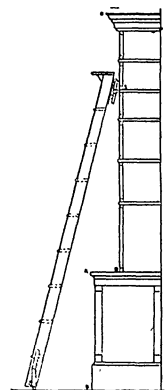


Fig. 3.—Ladder in Use.



Fig. 4.—Ladder Not in Use.

that they are sold at a moderate price. The ladders are made in a variety of woods and in various sizes, and are furnished to order for any kind of irregular shelving, also to run around a curve.

### The Columbia Breast Chain.

Baker Chain & Wagon Iron Mfg. Company, Allegheny, Pa., are putting on the market the breast chain herewith shown. The manufacturers claim

pounds. As no wood is used all shrinking and warping are obviated, while odors are not absorbed and retained. The ice chamber is removable and is made of galvanized steel. The grates are adjustable and revolving, thus making the rear of the shelves as accessible

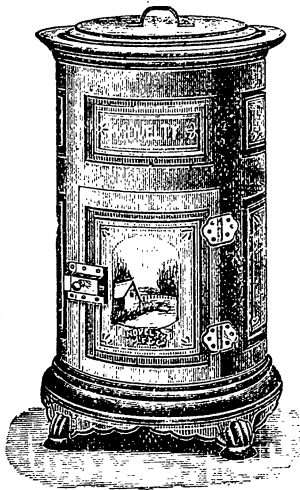


*The Columbia Breast Chain.*

that it is easy on the animal, that it will wear a long time, that it takes all sudden jerks and pulls, thus relieving the animal, that the snap opens easily and will never wear out, and that the tees will not allow the ring to come unfastened.

### The Novelty Metallic Refrigerator.

The Novelty Mfg. Company of Jackson, Mich., have put upon the market a refrigerator in whose construction no



*Fig. 1.—Novelty Metallic Refrigerator.*

wood is used. It is herewith illustrated, Fig. 1 showing the refrigerator closed and Fig. 2 showing it open with the parts removed for cleansing. The height of the refrigerator is 46 inches, base included. Its diameter is 28 inches. Its weight is less than 150

as the front and avoiding the contact of hands or clothing with the contents of front dishes. A galvanized tube conducts the waste from the ice chamber and supports the revolving grates. All inside parts are galvanized. It is mounted on a solid roller base, hand-



*Fig. 2.—Refrigerator with Parts Removed.*

somely decorated. The door trimmings are of polished brass, attractively designed. The outside casing is paneled and decorated in an artistic manner. With regard to the principles on which it is constructed the manufacturers state that it is "a refrigerator in every sense of the word."

THE SHANNON MFG. COMPANY, Eleventh and Catharine streets, Philadelphia, have purchased the patterns, machinery, tools and manufacturing

interests of J. B. Shannon & Sons, and state that they are prepared to meet the increasing demand for Hardware and Art Metal Work heretofore made by the former concern. An illustrated catalogue and price-list of 208 pages is devoted to a large and varied assortment of goods made by the company, a full line of which will be carried by J. B. Shannon & Sons, 1020 Market street, Philadelphia.

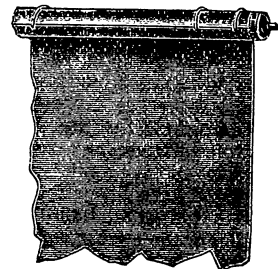
### Currier's Curtain and Map Fastener.

The cuts here shown represent a curtain fastener known as the Clincher, being introduced by L. D. Sanborn for



*Fig. 1.—Currier's Curtain and Map Fastener.*

Currier & Co., 168 Barclay street, Grand Rapids, Mich. The fastener, Fig. 1, is made of steel spring wire of a size to



*Fig. 2.—Application of Currier's Fastener.*

adhere closely to a curtain roller. In use the curtain is put around the roller and the clinchers slipped on, three to an

ordinary shade, as shown in Fig. 2. The manufacturers remark that with the use of clinchers no tacks are necessary, tearing of curtains is obviated, and that if the curtain does not hang plumb the clinchers may be slipped off and the curtain readjusted. The makers claim that the clincher will hold the curtain fast, and that it cannot slip on the rollers; that it can be adjusted to the roller quickly; that it will never wear out, and that they cost but little more than tacks.



**Excelsior Hammock Swing.**

The accompanying illustration represents a hammock swing put on the market by the American Roofing Company, 15-17 Public Landing, Cincinnati, Ohio. The roof frame is composed of two light iron rods at the outer edges and apex and a central bar of oak. It

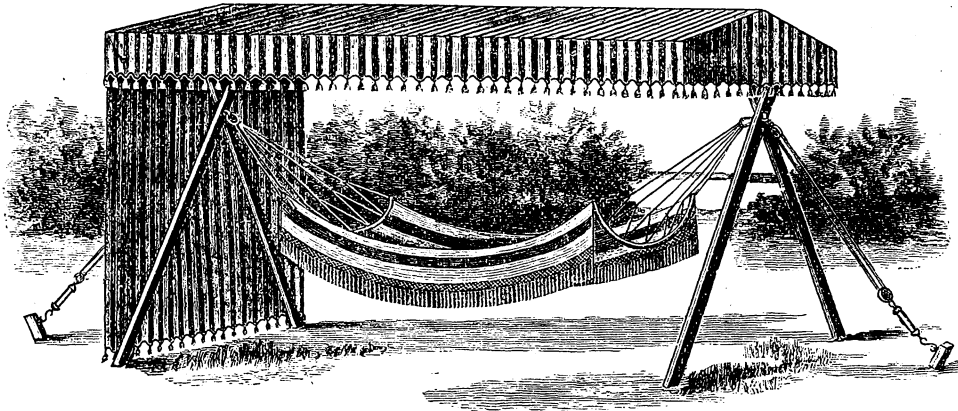
**Gas Cake Griddle.**

The Stuart & Peterson Company, Burlington, N. J., are offering gas cake griddles, as illustrated in the accompanying cut. Each griddle and waffle iron is controlled by an independent burner, so that it is not necessary to heat the entire frame to fill an

with a capacity of 16 cakes, and a waffle iron with 8 cakes.

**Dog Collar Locks and Collars.**

I. Bremer, 44 Duane street, New York, is marketing several new locks for dog collars. These are made entirely

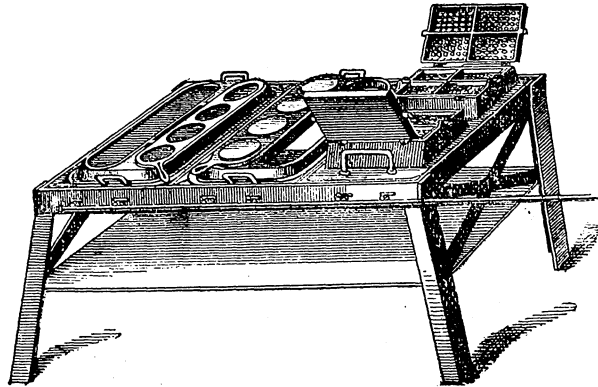
*Excelsior Hammock Swing.*

is explained that the device can be knocked down in a small space for shipping; that it requires but a few moments to set up in position, and that when in position it is perfectly rigid. The point is made that the swing makes a handsome appearance, and that it is an ornament to the premises; that it can be converted into a tent by adding side curtains, and that where lawn space is not available the swing can be set on a veranda or porch. The swing is sold complete with one end curtain. Extra curtains for the end and sides, and hammocks in a variety of styles are furnished as desired.

**Gem Alarm Lock Cash Till.**

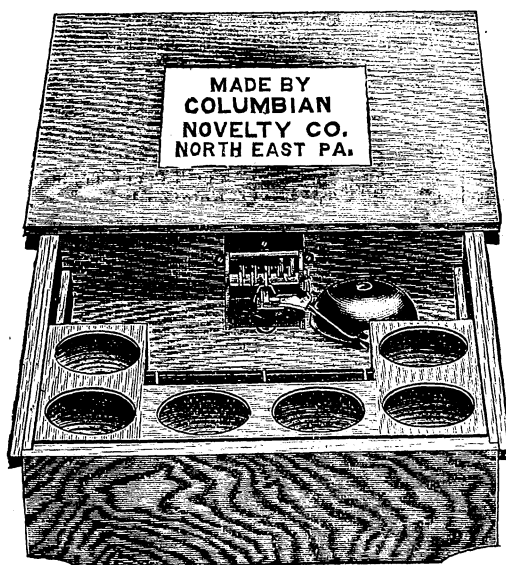
The Columbian Novelty Company, North East, Pa., are offering an alarm lock cash till, as illustrated herewith. The manufacturers remark that these

order for a few cakes, resulting, it is explained, in a great saving of gas. of German silver so that after rubbing with chamois they always look the

*Gas Cake Griddle.*

The goods are made in four sizes, as follows: No. 1, 3 griddles with a ca-

same, there being no plating to wear off. A feature of their manufacture is the absence of acid baths, necessary in plating, which would be apt to corrode the springs. These are obviated by the use of German silver in their manufacture, which is polished before the parts are cut out, the locks being burnished after they are put together. One of these padlocks, opened with a key turning either right or left, is but  $1\frac{3}{8} \times \frac{1}{2} \times \frac{1}{8}$ , extreme measurements, and some smaller still in sterling silver are to be brought out. Another lock made is opened by inserting a pin and pushing back the spring. Dog collars are also made by the manufacturer in great variety, in Levant, morocco, lizard and other fine leathers trimmed variously in sterling silver, German silver, &c., one of which was recently made and sold for \$85. The house make a specialty of trimming up show windows and counters with sample cases filled with their goods artistically arranged. This is done at their own expense, provided the business of the customer will warrant the expenditure.

*Gem Alarm Lock Cash Till.*

goods combine a large number of changes, simplicity and convenience, with superior workmanship and material in their construction. The tills are packed half a dozen in a crate.

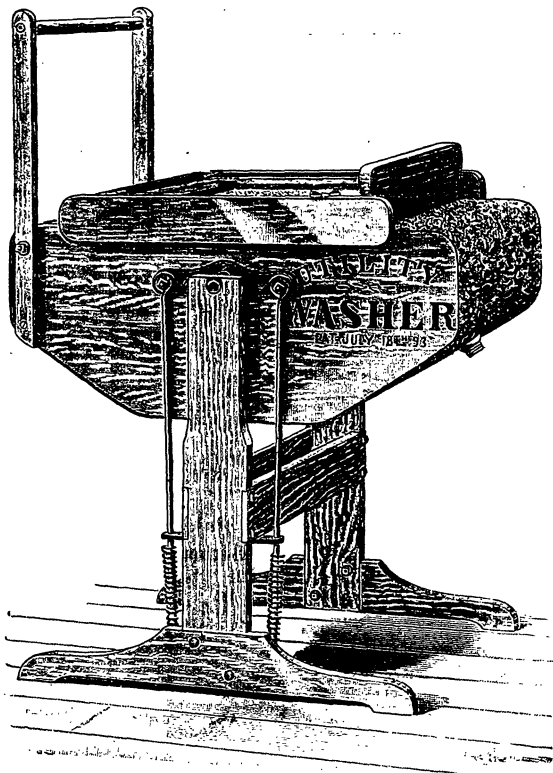
capacity of 18 cakes at one time; No. 2, 3 griddles with a capacity of 24 cakes at one time; No. 3, 2 griddles with a capacity of 12 cakes, and a waffle iron with 8 cakes, and No. 4, 2 griddles

The Stott Garden Implement Company, 136 Liberty street New York, are putting on the market an insecticide, which they have named Fir Tree Oil Soap. The gum of the fir tree is saponified by the incorporation with it of other insecticides, forming a paste, which is readily soluble in water for

application by spraying or other means. It is said to have many uses outside of floriculture, but is referred to as especially destructive to mealy bug, scale and aphids, without in the least injuring such delicate plants as the coleus or

### Utility Oscillating Washer.

Olds Wagon Works, Fort Wayne, Ind., are putting on the market the washer here shown. In construction



Utility Oscillating Washer.

begonia. It is packed in tin cans from pound to much larger sizes.

### Catches Nos. 22 and 23.

The accompanying cuts represent catches offered by Grand Rapids Brass Company, 156-166 Court street, Grand Rapids, Mich. In the Tobey catch, Fig. 1, the wheel or spring catch turns

the machine is described as having the bottom, ends and top made of one piece of galvanized iron, which, besides being turned upon the edges, is sealed to the solid wood side pieces with the best of sheet rubber packing, and the whole then securely nailed with cement coated nails, making, it is stated, an absolutely water tight box, which the makers guarantee not to leak. The washer is provided with compensating springs which, it is explained, make the load in



Fig. 1.—Tobey Catch No. 22.

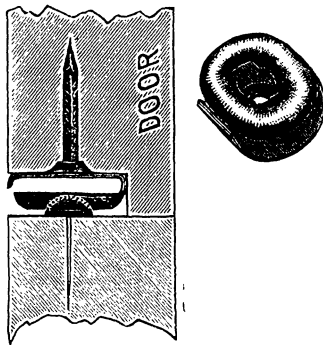


Fig. 2.—Grand Rapids Catch No. 23.

on its axis as the door is shut or opened. This it is explained prevents any jolt or jar which might break the glass in the door; and that the catch rolls in or out of its socket easily. In Fig. 2 catch No. 23 is shown in position on a door, and is referred to as an effective and cheap catch for common use. The catches are designed for the use of furniture manufacturers and the cabinet hardware trade.

the machine itself furnish nearly all the power necessary to operate it, thus greatly reducing the labor of the person using it.

WALTER TIPS, now a Senator in the Texas Legislature, better known to the trade as a Hardware merchant, long established at Austin, Texas, has, with other leading merchants in that State, been making a tour of Northern

cities with Governor Hogg of Texas. The party left New York last week for Boston and will return South via Washington, D. C. Their purpose is to bring the various interests of their Commonwealth to the attention of capitalists and others in the North.

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# Current Hardware Prices.

JULY 3, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

## Adjusters, Blind—

Domestic.....\$ doz \$3.00, 83% @ 83% & 10%  
Excelot.....\$ doz \$10.00.....50 & 10 & 5%  
North's.....\$ doz \$10.00.....50 & 10 & 5%  
Zimmerman's—See Fasteners Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

### American—

Eagle Anvil, 10 lb.....15 @ 15 & 5%  
Horse shoe brand, Wrought.....11 @ 11 & 5%  
Moore & Barnes Mfg. Co.....39%

### Imported—

Armitage Mouse Hole.....9% @ 10%  
B. & H., machine finished.....10% @ 11%  
Trenton.....10% @ 10%  
Wilkinson's.....10% @ 10%  
Peter Wright's.....10% @ 11%

## Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%  
Cheney Anvil and Vise.....25%  
Miller's Falls Co., \$18.00.....20%  
Holt's.....40 @ 40 & 10%

## Apple Parers—See Parers

## Augers and Bits—

Boring Machine Augers.....70 @ 70 & 10%  
Car Bits, 12-in. twist.....50%  
Common Augers and Bits.....70 @ 70 & 10%  
Cincinnati Bell-Hangers' Bits.....30 & 10%  
Forstner Pat. Auger Bits.....15%  
Jennings' Pattern Car Bits.....40%  
Jennings' Pattern Auger Bits.....40%  
J. E. Jennings & Co., No. 10, extension.....40%  
O. E. Jennings & Co., No. 30.....60%  
O. E. Jennings & Co., Auger Bits, 1/2 set.....32%  
Russell Jennings' Augers and Bits.....25 & 10%  
Lewis' Patent Single Twist.....15 & 10%  
L'Hommedieu Car Bits.....15 & 10%  
Pugh's Black.....20%  
Pugh's Jennings Pattern.....30%  
Snell's Bits.....60 & 5 @ 60 & 10%

## Bit Stock Drills—

Cleveland.....50 & 10 & 5%  
Cincinnati, for wood.....30 & 10%  
Cincinnati, for metal.....45 & 10%  
Morse Twist Drills.....50 & 10 & 5%  
New Process Twist Drill Co.....50 & 10 & 5%  
Standard.....50 & 10 & 5%  
Syracuse, for metal.....60 & 10%  
Syracuse, for wood (wood list).....30 & 5 @ 30 & 5%

## Expansive Bits—

Clark's small, \$18; large, \$20.....35 @ 35 & 10%  
Ives' No. 4, 1/2 doz, \$60.....40%  
Geor's No. 1, 2 doz, \$18.....35 @ 40%  
Stearns' No. 2, \$48.....20%  
Swan's.....40%

## Gimlet Bits—

See.....25 @ 25 & 10%  
Common.....\$ gross \$2.50 @ \$3.00  
Diamond.....\$ doz \$1.25.....40 & 10%  
Double Cut:  
Hartwell's.....\$ gro, \$10.00, 40 & 10%  
Douglass.....40 & 10 @ 50%  
Ives.....60 & 10 @ 60 & 10%  
Shepardson's.....45 & 10 @ 45 & 10 & 5%

## Hollow Augers—

Bonney's Adjustable, \$ doz \$48.....50%  
Cincinnati Adjustable.....25 & 10%  
Cincinnati Standard.....35 & 10%  
Douglass.....39% @ 39% & 10%  
French, Swift & Co. (Becher).....39% @ 39% & 10%  
Ives'.....39% @ 39% & 10%  
Ives' Expansive, each \$4.50.....50 & 5%  
Stearns'.....30 & 10%  
Universal Expansive, each \$4.50.....30%  
Wood's, 1/2 doz, \$48.....25 & 10%  
25 @ 25 & 10%

## Ship Augers and Bits—

L'Hommedieu's.....15 & 10 @ 15 & 10 & 5%  
Snell's.....25 @ 25 & 10%  
Snell's Ship Auger Pat'n Car Bits.....15 & 10 @ 15 & 10 & 5%  
Watrous'.....25 @ 25 & 10%

## Awl Hafts—See Hafts, Awl.

## Awls—

Brad, Handled.....\$ gr. \$2.50 @ \$3.00  
Brad, Shoulders.....\$ gr. \$1.50 @ \$1.40  
Peg, Pat.....\$ gr. \$1.50 @ \$1.40  
Peg, Should.....\$ gr. \$1.50 @ \$1.40  
Scratch, Handled.....\$ gr. \$4.00 @ \$4.50  
Scratch, Socket.....\$ doz \$1.10 @ \$1.20

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First quality, best brands.....\$6.00 @ \$8.50  
First quality, other brands.....5.50 @ 6.00  
Beveled add 50¢ @ doz.

## Axle Grease—See Grease, Axle.

## Axles—

o. 1 Common.....36 @ 36%  
o. 2 Common.....46 @ 46%  
Nos. 7 to 14.....70%  
Nos. 15 to 22.....47%  
Nos. 19 to 22.....70%  
Concord Axles, loose collar.....\$4 @ 4%  
Concord Axles, solid collar.....5¢ @ 5%  
Tubular Axles.....50

## Bag Holders—See Holders.

## Bags—

## Balances—

Sash—  
Caldwell, low list.....30%  
Pullman.....60%

## Spring—

Spring Balances.....40 @ 40 & 10%  
No. 200.....20  
Chatillon, \$ doz.....\$0.80 0.95 1.75 net  
Chatillon Straight Balances.....40 @ 40 & 10%  
Chatillon Circular Balances.....60 @ 10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel.....\$ 2 1/2 @ 3¢  
Iron, Steel Points.....\$ 2 1/2 @ 2 1/2¢

### Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-in. \$1.80;  
12-inch, \$2.00; 13 1/2-inch, \$2.50; 16-inch, \$3.00.

### Beams, Scale—

Scale Beams, List Jan. 12, '82.....60 & 10%  
Chatillon's No. 1.....60 & 10 & 5%  
Chatillon's No. 2.....50 & 10 @ 50 & 10%  
Custer's.....39%

## Beaters—

Egg—  
Bryant's.....\$ gross \$14.00  
Double (H. & R. Mfg. Co.), \$ gro, No. 0.....\$12.00; No. 1, \$15.00; No. 2.....\$36.00  
Dover.....\$ doz \$1.00 @ \$1.20  
Dover (Standard Co.).....\$ doz \$1.00  
Duplex (Standard Co.).....\$ doz \$1.00  
Duplex Extra Heavy (Standard Co.).....\$ doz \$2.50  
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00  
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.00  
Silver & Co.....\$ gro \$5.50  
Spiral.....\$ gro \$4.25 @ \$4.50  
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50

## Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1.  
No. 2, \$2.....20%

## Bells—

Cow—  
Common Wrought.....60 & 10%  
Kentucky Durham.....70 & 10%  
Kentucky, Sargent's list.....70 & 10%  
Kentucky, "Star".....20 & 10%  
Texas Star.....50 & 10 @ 50 & 10%  
Western, Sargent's list.....70 & 10%

## Door—

Crank, Brooks'.....50 & 10 & 5%  
Crank, Connel's.....20 & 10%  
Gong, Abbe's.....39% @ 40%  
Gong, Barton's.....40 & 10 @ 50%  
Gong, Yankee.....45 & 10%  
Lever, R. & E. Mfg. Co.'s.....50 & 10 & 5%  
Lever, Sargent's.....60 & 10%  
Lever, Taylor's Bronzed or Plated.....25 & 10%  
Lever, Taylor's Japanned.....25 & 10%  
Pull, Brooks'.....50 & 10 & 5%

## Electric—

Bigelow & Downes.....20 @ 20 & 10%  
Wollensak's.....20 @ 20 & 10%

## Hand—

Extra Heavy Brass.....70%  
Light Brass.....70 & 10 @ 70 & 10%  
Silver Chime.....39% @ 40%  
White.....25 & 10 @ 35%  
Globe Cone's Patent.....25 & 10 @ 35%

## Miscellaneous—

Call.....45 @ 50%  
Farm Bells.....\$ 2 1/2 @ 3¢  
Steel Alloy Church and School Bells.....50%

## Bellows—

Blacksmiths'.....60 & 10 @ 70%  
Hand Bellows.....40 & 10 @ 50%  
Molders'.....40 & 10 @ 50%

## Belting, Rubber—

Common Standard.....75 & 10 @ 75 & 10%  
Extra.....60 & 10 @ 65%  
Standard.....70 & 10 @ 75%  
N.Y.B. & F. Co., Carbon.....60 & 10%  
N.Y.B. & F. Co., Double Diamond.....60%  
N.Y.B. & F. Co., 1846 Paris.....40 & 10%

## Bench Stops—See Stops, Bench

## Benders and Upsetters—

## Tire—

Detroit Perfected Tire Bender 15 @ 15 & 10%  
Green River Tire Benders and Upsetters.....20%  
Stoddard's Lightning Tire Upsetters.....15%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mal. Iron.....50 & 10 @ 50%  
Moore's Novelty, Mal. Iron.....50 @ 50 & 5%  
Sore Grip Steel Tackle Blocks, 25 @ 25 & 10%  
See also Machines, Hotting.

## Boils—

### Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 10 @ 80 & 10%  
Genuine Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 10%

### Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10%  
Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10%  
Cast Iron Shutter Bolts.....75 & 10 @ 75 & 10%  
Ives' Patent Door Bolts.....80 & 10 @ 80 & 10%  
Wrought Barrel.....75 & 10 @ 80%  
Wrt B. K. Flush Common.....60 & 10 @ 60 & 10%  
Wrt Shutter, Brass Knob.....60 & 10 @ 60 & 10%  
Wrt Shutter, Sargent's list.....60 & 10 @ 60 & 10%  
Wrt Shutter, Stanley's.....65 @ 70%  
Wrought Square.....75 & 10 @ 80%  
Wrt Sunk Flush, Sargent's list.....60 & 10%  
Wrt Sunk Flush, Stanley's list.....80 @ 80 & 10%

### Stove and Plow—

Plow.....60 & 10 @ 60 & 10%  
Stove.....65 @ 70%  
R. B. & W., Plow.....55%

### Tire—

Common, list Feb. 28, '83.....70 @ 70 & 10%  
Norway, Phila., list Oct. 16, '84.....75%  
Eagle, Phila., list Oct. 16, '84.....80%  
Bay State, list Feb. 28, '83.....70%  
Port Chester Bolt and Nut Company:  
Empire list Feb. 28, '83.....70%  
Keystone, Philadel., list Oct. '84.....80%  
R. B. & W., Philadel., list Oct. 16, '84.....80%

### Borers, Tap—

Common and Ring.....20 & 10%  
Clark's.....39% @ 35%  
Enterprise Mfg. Co.....25%  
Ives' Tap Borer.....39% @ 35%

### Boring Machines—See Ma-

### chines, Boring.

### Bow Pins—See Pins, Bow.

### Boxes, Letter—

Tatum's.....40

### Boxes, Wagon—

Per doz.....24%

### Boxes, Miter.

Spilker's Excelator, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

## Braces—

American Bit Brace and Tool Co.:  
Nos. 10, 12, 20.....80 & 10%  
Nos. 11, 21, 24, 27.....70 & 10%  
Nos. 22, 23, 25.....80 & 10%  
Nos. 13, 26, 30, 37.....70 & 10%  
Amidon's:  
Barker's Imp'd Plain.....75 & 10 @ 80%  
Barker's Imp. Nickeled.....65 & 10 @ 70%  
Ratchet.....75 & 10 @ 80%  
Eclipse Ratchet.....60%  
Globe Jawed.....40 @ 40 & 10%  
Corner Brace.....40 @ 40 & 10%  
Universal, 3 in. \$2.10; 10 in. \$2.25  
Buff & Bell.....\$1.10 @ 1.15  
Barber's.....50 & 10%

### Bartholomew's

Armstrong's.....50 & 5%  
Common Ball, American.....\$1.00 @ \$1.10  
Davis Patent.....50 & 10%  
Fray's Genuine Spofford's.....50 & 10%  
Fray's Nos. 70 to 120, \$1 to 125.....50 & 10%  
Ives' New Haven Novelty.....70 @ 70 & 5%  
New Haven Ratchet.....60 & 5 @ 60 & 10%  
Barber Ratchet.....60 & 5 @ 60 & 10%  
Barber's.....60 & 5%  
Spofford.....60 & 5 @ 60 & 10%  
P. & W. Co., Peck's Patent.....60%  
Rose & Johnson.....60%  
Saxton's.....75 & 10 @ 80%  
Barker's Imp. Nickeled.....65 & 10 @ 70%  
Ratchet, Polished.....50 & 10 @ 60%  
Ratchet, Nickeled.....40 & 10 @ 50%  
Buffalo Ball.....net, \$1.10 @ \$1.15

### Buckets—

Shelf, fancy.....70 @ 70 & 10%  
Other makes at a wide range of prices.  
Shelf, plain.....65 @ 70%  
Regular, list.....60 & 10 @ 70 & 10%  
Sargent's list.....70 & 10%  
Bradley Shelf Buckets.....70 & 10%

### Bright Wire Goods—See Wire.

### Brollers—

Hemis Self-Inch.....9 10 9x11  
Basting, Per doz.....\$4.50 5.50 6.50  
Morse's, Odless.....\$ doz \$15, 50%  
New Haven.....60%  
Queen City.....39%  
Wire Goods Co.....45 & 10%  
See Pails, Japanned.

### Bull Rings—See Rings, Bull.

### Butcher's Cleavers—See Cleavers, Butcher's.

### Butts—

Brass—  
Cast Brass, Fast.....39% @ 10%  
Cast Brass, Loose Joint.....39% @ 10%  
Cast Brass, Tiebout's.....80%  
Wrought Brass.....80 & 10 @ 80 & 20%

### Cast Iron—

Fast Joint, Broad.....60 @ 60 & 5%  
Fast Joint, Narrow.....60 @ 60 & 5%

## Loose Joint, Japanned.....

Loose Joint, Jap. with Acorns.....75 & 10 @ 80%  
Loose Pin, Acorns.....75 & 10 @ 80%  
Loose Pin, Acorns, Japanned.....75 & 10 @ 80%  
Loose Pin, Acorns, Japanned, Plated Tips.....75 & 10 @ 80%  
Mayer's Hinges.....75 & 10 @ 80%  
Parliament Butts.....75 & 10 @ 80%

## Wrought Steel—

Fast Joint, Broad.....75 & 10 @ 80%  
Fast Joint, Narrow.....75 & 10 @ 80%  
Fast Joint, Lt. Narrow.....75 & 10 @ 80%  
Inside Blind, Light.....75 & 10 @ 80%  
Inside Blind, Regular.....75 & 10 @ 80%  
Loose Joint, Broad.....75 & 10 @ 80%  
Loose Pin.....75 & 10 @ 80%  
Table Butts, Back Flap.....75 & 10 @ 80%  
Bronzed Wrought Butts.....50 & 10 @ 50 & 10 & 5%

## Cages, Bird—

Hendryx Brass:  
3000, 5000, 1100 series.....10%  
3200 series.....40%  
200, 300, 600 and 900 series.....40 & 10 @ 50%  
Hendryx Bronze:  
700, 800 series.....40 & 10 @ 50%  
Hendryx Enameled.....40 & 10 @ 50%

## Callipers—See Compasses.

## Calks Toe—

Burke's, One Prong, Blunt.....45 @ 50%  
Burke's, One Prong, Sharp.....55 @ 60%  
Burke's, Two Prong, Blunt.....55 @ 60%  
Burke's, Two Prong, Sharp.....55 @ 60%  
Gautier, One Prong, Blunt.....55 @ 60%

## Can Openers—See Openers, Can.

## Cans Milk—

S. & Co.: 5-gal. \$8.00; 8-gal. \$4.40;  
10-gal. \$4.75 each.....40 & 10%

## Cans Oil—

Galvanized Blue Band, 1 gal., \$ doz \$3.35  
Galvanized Blue Band, 5 gal., Tip-Top.....\$ doz \$12.00  
Galvanized Blue Band, 5 gal., Faucet.....\$ doz \$8.00  
Glass Oil, Friend.....\$ doz \$3.75

## Caps—Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. \$100  
Eley's E. B.....50 @ 55%  
Eley's D. Waterproof, Central Fire \$1.00  
E. B. Grnd. Edge, Cent. Fire, 1-10's \$7.50  
E. B. Trimmer Edge, 1-10's.....47 @ 50%  
F. L. Waterproof, 4-10's.....35 @ 40%  
G. D.....27 @ 30%  
Musket, Waterproof, 1-10's.....50 @ 55%  
S. B. Genuine Imported.....45%

## Primers—

Berdan Primers, \$1.00.....25%  
R. L. Caps (Sturtevant Shells) \$1.00.....25%  
All other Primers, \$1.20.....25%

## Cards—

Watson's Cotton, Wool, Horse and File, list January 23, 1891.....25%

## Carpet Stretchers—

See Stretchers, Carpet.

## Cartridges—

B. B. Caps, Coll. Ball, Swgd., \$1.35 @ \$1.90  
B. B. Caps, Round Ball.....\$1.60 @ \$1.65  
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.  
Blank Cartridges, 22 cal. \$1.75.....35  
Blank Cartridges, 32 cal. \$1.75.....35  
Cent. Fire, Military and Sporting 15 & 5 @ 35%  
Cent. Fire, Pistol and Rifle.....25 & 5 @ 35%  
Primed Shells and Bullets.....15 & 5 @ 35%  
Rim Fire Cartridges.....50 & 5 @ 35%  
Rim Fire Military.....15 & 5 @ 35%

## Carpet Sweepers—

See Sweepers, Carpet.

**Chalk Lines**—See *Lines*.  
**Checks, Door**—  
 Bardsley's.....20%  
 Unity.....50%  
**Chisels**—  
**Socket Framing and Firmer**  
 Ohio Tool Co.....75¢100¢80%  
 P. S. & W.....  
 Witherby.....  
 Buck Bros.....30%  
 Charles Buck.....30%  
 Douglas.....75¢75¢10%  
 Merrill.....60¢100¢100¢10%  
 L. & J. White.....30¢30¢5%  
**Tanged and Miscellaneous**  
 Buck Bros.....30%  
 Charles Buck.....30%  
 Butchers.....\$4.75¢\$5.00 to 2  
 Spear & Jackson's.....\$5 to 2  
 Tanged Firmers.....50¢50¢10%  
 L. & J. White, Tanged.....25¢5%  
 Cold Chisels, fair quality, 7 gal.....14¢10%  
**Chucks**  
 Beach Pat.....each, \$8.00.....20%  
 Danbury.....each, \$6.00, \$8.00, \$10.00  
 Graham Patent.....38%  
 Morse's Adjustable, each, \$7.00, \$10.00, \$12.00  
 Syracuse, Bais Pat.....25%  
 Skinner Patent Chucks.....40%  
 Combination Lathe Chucks.....40%  
 Drill Chucks.....40%  
 Independent Lathe Chucks.....40%  
 Planer Chucks.....20%  
 Universal Lathe Chucks.....40%  
 Union Mfg. Co.....40%  
 Combination.....40%  
 Independent.....40%  
 Universal.....40%  
 Victor.....\$8.50, 25%  
**Churns**—  
 McDermald Star Barrel Churn, each 6 gal, \$2.00; 10 gal, \$2.75; 15 gal, \$3.00; 20 gal, \$3.25.  
 Tiffin Union, each 6 gal, \$3.25; 7 gal, \$3.75; 10 gal, \$4.25.  
**Clamps**—  
 Adjustable, Cincinnati.....15¢10%  
 Adjustable, Hammers.....15¢15¢5%  
 Adjustable, Stearn's.....30¢30¢10%  
 Barnes' Machinists' Clamps.....38%  
 Cabinet, Sargent's.....70¢10%  
 Carpenter's, Cincinnati.....25¢10%  
 Carriage Makers, P. S. & W. Co., 40%  
 Carriage Makers, Sargent's.....75¢75¢5%  
 Eberhard Mfg. Co.....40¢50¢10%  
 Joiners' Clamps, Tatum's.....25¢10%  
 R. I. Tool Co.'s Wrought Iron.....25%  
 Saw Clamps, see Vices, Saw Filers  
 Stearn's Malleable, with Wrought Iron Screw.....75¢75¢5%  
 Warner's.....40¢100¢40¢10%  
**Cleavers, Butchers**—  
 Beatty's.....40¢50¢10%  
 Bradley's.....25¢30%  
 Foster Bros.....30%  
 New Haven Edge Tool Co.'s.....40%  
 Nichols Bros.....30%  
 P. S. & W.....35%  
 Schulte, Lohoff & Co.....40¢40¢5%  
 L. & J. White.....25%  
**Clips**—  
 Baker Axle Clips.....25%  
 Norway, Axle.....65¢10%  
 Norway Spring Bar Clips.....65¢10%  
 24 Grade Norway, Axle.....70%  
 Steel Felloe Clips.....70%  
 Superior Axle Clips.....70%  
 Wrought Iron Felloe Clips.....70%  
**Cloth and Netting, Wire**—  
 See *Wire, etc.*  
**Cockeyes**.....50%  
**Cocks, Brass**—  
 Hardware List (Globe, Kerosene, Lever, Bibbs, Racking, &c.).....60¢40¢10%  
**Coffee Mills**—See *Mills, Coffee*.  
**Collars**—  
 Brass, Pope & Sons' list.....40%  
 Chapman Mfg. Company, new list.....40%  
 Embossed, Gift, Pope & Stevens' list 30¢10%  
 Leather, Pope & Stevens' list.....40%  
 Medford Fancy Goods Co.....40¢10%50%  
**Combs Curry**—  
 American Curry Comb Co.....33%40%  
 Fitch's.....50¢100¢10%  
 Gibbs' Magnolia.....\$2.00  
 Kohler's Humane.....\$1.75  
 Kohler's Magic Oscillating.....\$2.00  
 Rubber, per doz., \$10.00.....25%  
**Compasses, Dividers &c.**  
 Compasses, Callipers, Dividers, 70¢100¢75%  
 Bennis & Call Co.'s.....  
 Dividers.....85%  
 Callipers, Calli. Patent Inside.....55%  
 Callipers, Double.....65%  
 Callipers, Inside or Outside.....65%  
 Callipers, Wing.....60%  
 Compasses.....50¢5%  
 Excelsior.....50%  
 Barrett's.....25%  
 Combination Dividers.....25%  
 Lock Callipers and Dividers.....25%  
 Spring Callipers and Dividers.....25%  
 Stevens & Co.'s.....25%  
**Coolers, Water**—  
 S. B. & Co.: 2 gal, \$3.40; 3 gal, \$4.00; 4 gal, \$4.50; 5 gal, \$5.00 each.....60%  
**Coopers' Tools**—  
 See *Tools, Coopers*.  
**Cord**—  
 Braided, Crown, Drab and Fancy, 7/8.....30%  
 Braided, Crown White, 7/8.....50%  
 Cable Laid Italian Sash.....\$1.00, 20%  
 Common.....\$1.00, 20%  
 Common Russia Sash.....\$1.25, 15%  
 Egyptian, India Hemp, Braided.....20%  
 India Cable Laid Sash.....\$1.10, 12%  
 Massachusetts White.....22¢24¢  
 Osage Mills.....  
 Crown, Solid Braided White.....\$1.25, 20%  
 Crown, Drab and Fancy.....\$1.25, 20%  
 Braided Giant Drab and Fancy.....\$1.30, 20%  
 Braided, Giant, White.....\$1.25, 20%  
 Patent, good quality.....\$1.00, 15%  
 Patent Russia Sash.....\$1.10, 12%  
 Samsom.....  
 Braided, Drab Cotton.....\$1.40, 20%  
 Braided, Italian Hemp.....\$1.40, 20%  
 Braided, Lunen.....\$1.50, 20%  
 Braided, White Cotton.....\$1.30, 20%  
 Semper Idem, Braided, White.....20%  
 Silver Lake.....  
 A quality, Drab, 5/8.....25%  
 A quality, White, 5/8.....25%  
 B quality, Drab, 5/8.....10%  
 B quality, White, 5/8.....10%  
 Sylvan Spring, Extra Braided, Drab.....30%  
 Sylvan Spring, Extra Braided, White.....30%  
 Tate's Solid Braided.....  
 Economy, Drab.....\$1.27

**Economy, White**.....\$1.27  
 Hercules, Drab.....\$1.27  
 Hercules, White.....\$1.27  
 White Cotton Braided, fair.....\$1.27  
**Wire Pictures**.....80¢50¢15%  
 Braided or Twisted.....  
**Corkscrews**—See *Screws, Cork*.  
**Corn Knives and Cutters**—  
 See *Knives, Corn*.  
**Crackers, Nut**—  
 Acme.....  
 Japanned, 7/8, \$30.....50%  
 Nickel Plated, 7/8, \$30.....10%  
 Table (H. & B. Mfg. Co.).....40%  
 Turner & Seymour Mfg. Co.....50%  
**Cradles**—  
 Grain.....50¢25¢50¢52%  
**Crayons**—  
 White Crayons, 7/8 gross.....\$2.80  
 Cases, 10 gr, \$7.75; \$4.25, at factory.  
 D. M. Steward Mfg. Co.....  
 Metal Workers' 7/8 gross, \$2.50, 20 to 55%  
 Railroad, 7/8 gross, 2.00, 20 to 55%  
 Rolling Mill, 7/8 gross, 2.50, 20 to 55%  
 Soapstone Pencils, 7/8 gross, 1.50, 20 to 55%  
 See also *Chalk*.  
**Creamery Pails**—See *Pails, Creamery*.  
**Crow Bars**—See *Bars, Crow*.  
**Curry Combs**—  
 See *Combs, Curry*.  
**Cutters**—  
**Meat**—  
 American.....80%  
 Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 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821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 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1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 171



**Halters—**

Covert's Adj. Rope Halters.....	40¢25¢
Covert's Adj. Web Halters.....	35¢25¢
Covert's Hemp Horse and Cattle Tie.....	50¢10¢25¢
Covert's Jute Cattle Ties.....	70¢10¢25¢
Covert's Jute Horse Ties.....	70¢25¢
Covert's Rope, 7-16 in., Jute.....	70¢25¢
Covert's Rope, 1/2 in., Hemp.....	60¢25¢
Covert's Rope, Jute.....	60¢10¢25¢
Covert's Saddlery Works Halters.....	35¢25¢
Covert's Saddlery Works Handy Web Halters.....	35¢25¢
Covert's Saddlery Works Horse and Cattle Ties.....	35¢25¢

**Hammers—****Handled Hammers—**

Atha Tool Co.....	50¢10¢60¢
Buffalo Hammer Co.....	50¢10¢60¢
Humason & Beckley.....	Verree.....
Cheney's Claw.....	40¢10¢
Cheney's Machinists & Riveting.....	60¢5¢
C. Hammond & Son.....	40¢10¢50¢
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75.....	25¢10¢35¢
Maydole's, list Dec. 1, 85.....	25¢10¢35¢
Peck, Stow & Wilcox.....	40¢40¢55¢
Fayette R. Plumb.....	Artisan's Choice, A. E. Nail.....
Riveting, Engineers' and B. S. Hand.....	40¢10¢

**Machinists' Hammers—**

Regular V. & P. A. E. Nail.....	60¢10¢
Other Hammers.....	50¢5¢
Sargent's.....	40¢10¢50¢
Warner & Nobles, now list.....	25¢10¢

**Heavy Hammers and Sledges—**

8 lb and under.....	75¢40¢
8 to 15 lb.....	80¢80¢101¢
Over 15 lb.....	75¢30¢
Wilkinson's Smiths.....	10¢10¢40¢

**Handcuffs and Leg Irons—**

See Police Goods.

**Handles—****Cross-Cut Saw Handles—**

Atkins.....	40¢
Champion.....	15¢
Ely's Perfection.....	75¢
Sensible # doz. Pr.....	\$5.00, 60¢50¢10¢

**Iron, Wrought or Cast—**

Barn Door, # doz \$1.40.....	20¢5¢
Bronze Iron Drop Latches.....	70¢10¢75¢
Chest and Lifting.....	70¢10¢75¢
Door or Thumb.....	Nos. 0 1 2 3 4
Per doz.....	\$0.90 1.00 1.08 1.35 1.50

**Jap'd Store Door Handles—**

Nuts, \$1.25.....	60¢10¢10¢70¢
Plate, \$1.10, 2 plate, \$0.85.....	10¢
Roggin's Latches.....	70¢23¢30¢

**Wood—**

Anger, assorted.....	gr 5.00
Anger, large.....	gr 7.00
File, assorted.....	gr 2.75
Brad A W.....	gr 2.00
Apple Firmer Chisel, ass'd.....	gr 5.00
Apple Firmer Chisel, large.....	gr 6.00
Hickory Firmer Chisel, ass'd.....	gr 4.50
Hickory Firmer Chisel, large.....	gr 5.00
Socket Firmer Chisel, ass'd.....	gr 3.00
Socket Framing Chisel, ass'd.....	gr 5.00
Chisel, Fibre Head.....	33¢
Hammer, Hatchet, Axe, &c.....	40¢40¢55¢
Hoe, Rake, Shovel, &c.....	60¢40¢55¢
Pat. Auger, Douglass.....	set \$1.25
Pat. Auger, Ives.....	set \$1.00
Pat. Auger, Swan.....	set \$1.00
Saw and Plane.....	40¢10¢50¢
J. B. Smith & Co's Pat. File.....	50¢

**Hangers—**

Barn Door, New England.....	70¢70¢55¢
Barn Door, old patterns.....	70¢70¢55¢
Barry.....	50¢
Best Anti-Friction.....	60¢10¢60¢10¢
Boss.....	60¢10¢60¢10¢
Carrier Steel Anti-Friction.....	60¢10¢
Champion.....	60¢10¢
Chicago Anti-Friction.....	30¢10¢
Climax Anti-Friction.....	50¢
Cincinnati Nos. 1, 2, 25; 3, 25, 50; 4, 25, 50.....	60¢10¢10¢
Crane.....	60¢10¢10¢
Cronk's Patent, Steel Covered.....	60¢10¢
Duplex (Wood Track).....	60¢10¢25¢
Economy.....	60¢10¢
Hamilton Wrought Steel Track.....	55¢
Interstate.....	60¢10¢60¢
Kidder's.....	60¢10¢10¢
Lane's New Standard.....	60¢10¢
Lane's Parlor.....	40¢40¢55¢
Lane's Standard.....	50¢50¢60¢10¢
Lundy, Steel Parlor.....	40¢
Matchless.....	45¢10¢
Moody.....	50¢10¢
Moore's Baggage Car Door.....	35¢
Moore's Elevator.....	35¢
Moore's Railroad.....	50¢
Nickel, Steel, Nos. 0, 25; 1, 20; 2, 15.....	40¢10¢50¢
Orleans Steel.....	55¢
Paragon Nos. 5, 4, 7 and 8.....	20¢10¢
Pendulum, Payson's.....	40¢40¢10¢
Perfection.....	60¢10¢60¢10¢
Richards.....	30¢30¢10¢
Samson Steel Anti-Friction.....	55¢
Star.....	40¢10¢40¢10¢
Sears' Anti-Friction.....	20¢10¢
Sears' Challenge.....	25¢10¢
Sterling.....	50¢10¢60¢
Terry's Ideal.....	60¢10¢60¢10¢
Terry's Modern.....	50¢10¢60¢10¢
Terry's Shield.....	50¢10¢60¢
Terry's Solid.....	60¢10¢60¢
Terry's Wrought Single Strap.....	50¢10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; 3, \$18.00.....	20¢10¢
Warner's Pat.....	20¢10¢
West.....	45¢10¢
Zentith for Wood Track.....	55¢

**Harness Snaps—See Snaps.****Hatchets—**

American Axe and Tool Co.....	40 & 10 @ 50¢
Blood's.....	40 & 10 @ 50¢
Hunt's.....	40 & 10 @ 50¢
Kelly's.....	50 & 50 @ 10¢
P. S. & W. Co.....	50 & 50 @ 10¢
Sargent's & Co.....	50 & 50 @ 10¢
S. White, Lohoff & Co.....	50 & 50 @ 10¢
Ten Eyck Edge Tool Co.....	50 & 50 @ 10¢

**Hay and Straw Knives**

See Knives.

**Hinges—****Blind Hinges—**

Clark's Nos. 1, 3, 5, 1868, Old Pattern.....	75¢10¢55¢
Nos. 1 and 3, Tip Pattern.....	75¢10¢55¢
No 50 Buffalo Noiseless, 40, 60 and 65.....	75¢
Buffalo Reversible, Nos. 3, 2, 1, 1 and 0.....	70¢55¢
No. 1 Cottage, for wood only.....	80¢10¢
No. 1 Diamond, for wood only.....	80¢55¢
Dixie L. & P. Nos. 3, 2, 1, 1, 0, 00, 1 and 5.....	75¢10¢
No. 25, Empire Reversible.....	75¢10¢
Lull & Porter, Nos. 3, 2, 1, 1, 0 00, 4 and 5.....	75¢10¢25¢
Mortise Gravity, Nos. 2, 4, 4, 0, 8, 5 and 10.....	50¢
Huffer.....	50¢10¢
Parker.....	75¢10¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	75¢10¢
Reading Gravity.....	75¢10¢75¢10¢55¢
Sargent's Nos. 1, 3, 5, 11, 12, 18.....	75¢10¢75¢10¢55¢
Shepard's.....	Acme, Lull & Porter, Nos. 3, 2, 1, 1, 0, 00, 4 and 5.....
1, 0, 00, 4 and 5.....	75¢55¢
Buffalo Gravity Locking, Nos. 1, 3 and 5.....	80¢10¢
Champion Gravity Locking, No. 75.....	80¢10¢
Clark's or Shepard's 1868, Old Pattern, Nos. 1, 3 and 5.....	75¢10¢55¢
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....	75¢10¢55¢
Double Locking, Nos. 20 and 25.....	70¢55¢
Empire, Nos. 101 and 103.....	75¢55¢
Nakara Gravity Locking, Nos. 1, 3 and 5.....	80¢55¢
Noiseless Nos. 50, 60, 65 and 55.....	75¢
O. S. Lull & Porter, Nos. 3, 2, 1, 1, 0, 00, 4 and 5.....	75¢10¢
Pioneer, Nos. 500, 45 and 54.....	75¢
Steamboat Gravity Locking No. 10.....	80¢10¢

**Gate Hinges—**

Automatic.....	# doz \$12.50, 50¢
Clark's, Nos. 1, 2, 3.....	60¢10¢60¢10¢55¢
N. E. Reversible.....	# doz \$7.50, 60¢80¢10¢
N. E. Reversible.....	# doz \$5.50, 60¢80¢10¢
Y. State.....	# doz \$4.90, 60¢80¢10¢
Shepard's Nos. 1, 2, 3.....	60¢10¢60¢10¢55¢
Western.....	# doz \$2.20, 50¢60¢10¢

**Spring Hinges—**

Acme.....	30¢
American.....	20¢
Bardsley's Patent Checking.....	15¢
Barker's Double Acting.....	15¢
Bommer's Japanned.....	35¢
Bommer's All other Kinds.....	30¢
Buckman's.....	15¢20¢
Champion.....	60¢
Chicago.....	60¢
Columbia.....	# gross, \$12.00
Devore, No. 1.....	# gro, \$13.00
Freeport.....	# gro, \$12.00
Geer's Spring and Blank Butts.....	40¢
Gem.....	20¢
Ideal No. 3.....	# gross \$8.00
J. C. Covered.....	# gross, \$12.00
Knoxall.....	# gross \$10.00
New Idea No. 1.....	# gross, \$18.00
New Idea No. 2.....	# gross, \$18.00
New Idea Dbl. Acting.....	45¢
No. 10 Matchless.....	60¢
No. 25 Unbreakable.....	60¢
Orford.....	20¢
Reversible.....	60¢
Rex.....	# gro, \$13.00
Royal.....	60¢
Samson.....	60¢60¢75¢
Sears' Noiseless Floor Hinge.....	20¢10¢30¢
Surprise.....	# gross, \$12.00
Union Mfg. Co.....	25¢
Union Spring Hinge Co's list, March, 1886.....	20¢
Wiles, No. 1.....	# gro, \$16; No. 2.....
Wrought Iron Hinges—	Corrug'd Strap and T 60¢10¢60¢10¢55¢
Strap and T List May 22, 1894.....	0 10 10 10 10 55¢
Plate Hinges, 1/8, 10 & 12 in.....	60¢
"Providence" over 12 in.....	60¢
Roll'd Blind Hinges, Nos. 32 and 34.....	60¢10¢
Roll'd Blind Hinges, Nos. 232 and 234.....	55¢10¢
Roll'd Plate.....	70¢10¢
Roll'd Raised.....	70¢10¢
Screw Hook and Eye.....	{ in. # 7 1/2 4 1/2 3 1/2 1/2
Screw Hook and Eye.....	{ in. # 4 1/2 3 1/2 1/2
Screw Hook and Eye.....	{ 6 to 12 in. # 1 1/2 1 1/2 1 1/2
Strap.....	{ 22 to 36 in. # 1 1/2 1 1/2 1 1/2

**Wrought Iron Hinges—**

Corrug'd Strap and T 60¢10¢60¢10¢55¢

Strap and T List May 22, 1894.....

Plate Hinges, 1/8, 10 &amp; 12 in.....

"Providence" over 12 in.....

Roll'd Blind Hinges, Nos. 32 and 34.....

Roll'd Blind Hinges, Nos. 232 and 234.....

Roll'd Plate.....

Roll'd Raised.....

Screw Hook and Eye.....

Screw Hook and Eye.....

Strap.....

Wiles, No. 1.....

Wrought Iron Hinges—

Corrug'd Strap and T 60¢10¢60¢10¢55¢

Strap and T List May 22, 1894.....

Plate Hinges, 1/8, 10 &amp; 12 in.....

"Providence" over 12 in.....

Roll'd Blind Hinges, Nos. 32 and 34.....

Roll'd Blind Hinges, Nos. 232 and 234.....

Roll'd Plate.....

Roll'd Raised.....

Screw Hook and Eye.....

Screw Hook and Eye.....

Strap.....

Wiles, No. 1.....

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Roll'd Plate.....

Roll'd Raised.....

Screw Hook and Eye.....

Screw Hook and Eye.....

Strap.....

Wiles, No. 1.....

**Ceiling, Sargent's list.....**

Clothes Line, Moore's.....

Clothes Line, Reading list.....

Coat and Hat, Moore's.....

Coat and Hat, Reading.....

Coat and Hat, Sargent's list.....

Hammock, E. C. Stearns &amp; Co., # doz.....

Harness, Reading list.....

Atlas, Coat and Hat.....

Belt.....

Handy Hat and Coat.....

Indestructible Coat and Hat.....

Steady Ceiling Hooks.....

Williamson's Bird Cage Hooks, list.....

Wire Coat and Hat, Gem, list April, 1886.....

Wire Coat and Hat, Miles, list April, 1886.....

Wire Coat and Hat, Standard.....

Bright Wire.....

Wrought Iron—

Cotton Pat. (N. Y. Maillet and Handle Wks.).....

Tassel and Picture, T. &amp; S. Mfg. Co.....

Wrought Staples Hooks, &amp;c.....

See Wrought Goods

**Miscellaneous—**

Bush.....

Fish Hooks, American.....

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25

Hooks and Eyes—Brass.....

Hooks and Eyes—Malleable Iron.....

Noll's Grass.....

Whiffletree—Patent.....

Bench Hooks—See Bench Stops.

**Horse Nails—See Nails, Horse****Horse Shoes—**

See Shoes, Horse.

**Hose, Rubber—**

Competition, Fair quality.....

Competition, Low Grade.....

Extra.....

Standard.....

N. Y. B. &amp; P. Co., Carbon.....

N. Y. B. &amp; P. Co., Double Diamond.....

N. Y. B. &amp; P. Co., 1846 Para.....

Cotton Garden, 1/2 in., coupled.....

Fair Quality, # ft.....

Good Quality, # ft.....

**Huskers—**

Blair's Adjustable.....

Blair's Adjustable Clipper.....

Hubbard's Solid Steel.....

**Indurated Fiber Ware—**

See Ware, Indurated Fiber.

**Irons. Curling—**

Nicol's Patent Curling Iron Heater.....

# doz.....

Silver Tipped Grace Darling Curling Iron.....

No. 65.....

No. 68.....

No. 67, Mustache.....

**Sad—**

From 4 to 10, at factory.....

B. B. Sad Irons, # doz (at factory).....

Chinese Laundry (N. E. Butt Co.).....

Chinese Sad.....

Crown Improved.....

Ideal Irons, No. 250, # set, 65¢; No. 255.....

Mahon's Troy Pol. Irons.....

Mrs. Potts' Sad Irons, per set.....

Small lots.....

National Self-Heating.....

New England.....

Pottstamer, # set, No. 45, 65¢; No. 40, 70¢

Saratoga Irons.....

Self-Heating.....

Self-Heating Tailors.....

Sensible Sad Irons, per set.....

Nos. 2.....

Sensible Tailors' Irons.....

**Soldering—**





**Pullers Nail—**

Edgewise..... \$ doz., \$24.00, 40%  
 Economy..... \$ doz., \$5.50 @ \$6.00  
 Giant, No. 1..... \$ doz., \$18.00, 10 & 10%  
 Giant, No. 2..... \$ doz., \$15.00, 10 & 10%  
 Pelican..... \$ doz., \$9.00, 25 & 10%  
 Soranton..... \$ doz., \$18.00, 35 & 35 & 10%

**Pulleys—**

Brass Screw..... 70%  
 Hay Fork, "Anti-Friction," 5 in. solid..... 50%  
 Hay Fork, "F" Common and Patent..... 50%  
 Bushed..... 20%  
 Hay Fork, Moore's Anti-Friction 5..... 20%  
 Wheel, \$ doz., \$12.00..... 40%  
 Hay Fork, Reed's Self-Lubricating..... 60%  
 Hay Fork, Solid Eye, \$4.00; Swivel..... 40%  
 Hay Fork, Stearns' Nos. 15, 25, 50, 60, 80..... 60%  
 Hay Fork, Tarbox Pat. Iron..... 20%  
 Hot House, Awning, &c..... 60%  
 Japanned Clothes Line..... 60 & 10 & 10%  
 Japanned Sewer..... 70 & 10 & 10%  
 Japanned Side..... 70 & 10 & 10%  
 Moore's Ceiling or Anti-Friction 40%  
 Moore's Dumb Waiter, Anti-Friction 50%  
 Moore's Electric Light..... 35 & 10%  
 Moore's Side, Anti Friction..... 60%  
 Sash (Auger Mortise)..... 80%  
 Common Sense..... 80%  
 Empire..... 80%  
 Aime..... 80%  
 Ideal, Nos. 2, 4, 10 & 15..... 50% less 1¢  
 Star..... 50%  
 Ideal, or IXL, No. 60..... \$ doz. net.  
 On bbl. lots extra 5%  
 Shade Rack..... 45%  
 Shepard's Niagara, No. 25, \$ doz 25¢ net  
 Tackle Block—See Blocks.

**Pumps—**

Cleburn, Best Makers..... 60 & 10 & 10%  
 Pitcher Spout, Best Makers..... 70 & 10 & 10%  
 Pitcher Spout, Cheaper G'ds..... 75 & 10 & 10%  
 Myers' Pumps, low list..... 50%

**Punches—**

Avery's Revolving..... 40%  
 Avery's Sawset and Punch—See Sawsets  
 Bemis & Call Co.'s Cast Steel Drive..... 50 & 10%  
 Bemis & Call Co.'s Check..... 50%  
 Bemis & Call Co.'s Spring..... 50 & 10%  
 Bemis & Call Co.'s Springfield Socket..... 50%  
 Niagara Hollow Punches..... 50 & 10%  
 Niagara Solid Punches..... 50%  
 Rice and Punches..... 15%  
 Saddler's or Drive, good..... \$ doz., 60 & 10%  
 Spring, good quality..... \$ doz., 25 & 10%  
 Spring, Leach's Pat..... 15%  
 Solid Tinner's, P., S. & W. Co., \$ doz..... 15%  
 Tinner's Hollow Punches, P., S. & W. Co..... 20 & 10%  
 Co..... 20 & 10%

**Rail—**

Barn Door, Light, In..... \$ 1/4  
 For 100 feet..... \$1.75 2.10 2.75  
 B.D. for N. E. Hangers.....

**Rakes—**

Cast Steel, Association G'ds..... 70 & 10 & 10%  
 Cast Steel, Mt. d'g'ds..... 70 & 10 & 10%  
 Malleable, good..... 70 & 10 & 10%  
 Malleable, low grade..... 70%  
 Fort Madison Prize Bow Brace and..... 65%  
 Fort Madison Steel Tooth Lawn Rake..... 65%  
 \$6.00..... 25%  
 Gibbs' Acme Lawn Rake..... \$ doz., \$4.90  
 Gibbs' Canton Lawn Rake..... \$ doz., \$4.75  
 Gibbs' Crown Lawn Rake, No. 1..... \$ doz., \$4.90  
 Gibbs' Favorite Lawn Rake..... \$ doz., \$3.90  
 Gibbs' Hustler No. 0..... \$ doz., \$4.25  
 Gibbs' Hustler No. 1..... \$ doz., \$4.40  
 Oneida Lawn Rake..... \$ doz., \$4.00

**Razors—**

Campbell Cutlery Co..... 50%  
 Electric Outlery Co..... Net prices  
 Galvanic..... \$ doz., \$15.00  
 Jordan's A.A.I. New List..... Net prices  
 Jordan's Old Faithful, new List..... Net prices  
 J. B. Torrey Razor Co..... Net prices  
 Wostenholm and Butcher, \$10 to 2..... 10%

**Razor Stops—**

See *Traps, Razors*.

**Reels—**

Clothes Line..... 35 & 10%

**Fishing—**

Hendryx Aluminum, German Silver, Gold Bronze, Silver Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 25%  
 Hendryx Single Action Series..... 102P  
 and PN, 202P and PN, 102PR and PN, 202PR and PN, 502 and 502N, 802 and 82N, 10204N, 10204P, 10204N and PN, 2004N, 2004P and PN, 002904N, 0024 and 0024N, 5000N and PN..... 40 & 10%

**Registers—**

Moore's Bronze Finishes..... 70%  
 Moore's Electroplated..... 75%  
 Moore's Japanned..... 75%  
 Moore's Solid Bronze..... 85%  
 Moore's Stove Pipe..... 85%

**Rings and Ringers—**

Bull Rings..... 50 & 10 & 10%  
 Blotch Edw. Co., White Metal, low list..... 50 & 10 & 10%

**Hotchkiss' low list..... 30%**

Humason, Beckley & Co.'s..... 70 & 10%  
 Peck, Stow & W. Co.'s..... 50 & 10 & 10%  
 Sargent's..... 75 & 10%  
 Union Nut Co..... 55%

**Hog Rings and Ringers**

Note.—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

**Rivets and Burrs—**

Copper..... 60 & 10 & 10%  
 Coppered Iron, Betina Brand..... 50 & 10%  
 Iron Norway, List Nov. 17 '87..... 60 & 10%  
 Second Quality..... 70 & 10 & 10%

**Rivet Sets—See Sets.****Roasting and Baking**

Pans—See Pans, Roasting and Baking.

**Rods—**

Stair, Black Walnut..... \$ doz 40%  
 Stair, Brass..... 25 & 10%

**Rollers—**

Acme Moore's Anti-Friction..... 55%  
 Barn Door, Sargent's list..... 60 & 10 & 10%  
 Moore's Barn Door Stay..... 50%  
 Union Barn Door Roller..... 70%  
 Thompson Mfg. Co.'s Lawn Rollers..... 30%

**Rope—The following prices are for**

b. New York or factory, and are shaded 1/4¢ on large lots; terms 1 1/2% for cash.  
 Manila, 7-16 in. diam. and larger..... 7 1/4 @ 7 3/4  
 Manila, 1/2 in. and 5-16 in..... 8 1/4 @ 8 3/4  
 Manila, Tarred Rope..... 7 1/4 @ 7 3/4  
 Manila, Hay Rope, Med'm..... 7 1/4 @ 7 3/4  
 Sisal, 7-16 in. and larger..... 6 1/4 @ 6 3/4  
 Sisal, 1/2 in. and 5-16 in..... 6 1/4 @ 6 3/4  
 Sisal, Tarred Rope..... 5 1/2 @ 5 3/4  
 Sisal, Medium Lath Yarn..... 5 @ 5 1/4  
 New Zealand..... 7-16 in. and larger..... 5 1/2 @ 5 3/4  
 New Zealand, 3/4 in. and 5-16 in..... 6 @ 6 1/4  
 New Zealand, Hay Rope..... 6 1/4 @ 6 3/4  
 New Zealand, Tar'd Rope..... 5 @ 5 1/4  
 Cotton Rope..... 12 @ 15¢  
 Jute Rope..... 12 @ 15¢

**Wire—**

List February, 1892. All kinds..... 50%

**Rules—**

Boxwood..... 50 & 10 & 10%  
 Ivory..... 50 & 10%  
 Sargent's Steel Rules and Straight Edges..... 25 & 10%

**Sad Irons—See Irons, Sad.****Sand and Emery Paper and Cloth—**

See Paper and Cloth.

**Sash Cord—See Cord, Sash.****Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers—See Stuffers or Fillers.****Saws—**

Note.—Extra 5@10% often given.

Atkins' Circular..... 50 & 10%  
 Atkins' Band..... 50 & 10%  
 Atkins' Cross Cuts, new list..... 40%  
 Atkins' Mulay, Mill and Drag..... 50 & 10%  
 Atkins' One Man Saw..... 40%  
 Atkins' Wood Saw..... 40%  
 Atkins' Hand Compass, &c..... 40%  
 Diaston's Circular..... 45 & 10%  
 Diaston's Cross Cut, list Jan. 1, '93, 40 & 10%  
 Diaston's Hand..... 25%  
 E. C. Jennings & Co.'s..... 25%  
 Peace Cross Cut and Mill..... 45 & 10%  
 Peace Cross Cut, list Jan. 1, '93..... 45 & 10%  
 Peace Hand, Panel and Rip..... 25 & 10%  
 Richardson's Circular and Mill..... 45 & 10%  
 Richardson's X Cuts, list Jan. 1, '93..... 45 & 10%  
 Richardson's Hand, &c..... 25 & 10%  
 Simonds' Circular Saws..... 45 & 10%  
 Simonds' Crescent Ground Cross Cut Saws..... 30%  
 Simonds' One Man Cross Cuts..... 40 & 10%  
 Simonds' Gang, Mill, Mulay and Drag Saws..... 45 & 10%  
 Wheeler, Madden & Clemson Mfg. Co. Cross Cuts, list Jan. 1, 1893..... 45 & 10%  
 Hand, Panel and Rip..... 25 & 10%  
 Woodrugh & McParlin..... 80 & 10%  
 Cross Cuts, list Jan. 1, 1893..... 45 & 10%  
 Hand, Panel and Rip..... 25 & 10%

**Hack Saws—**

Eureka and Crescent..... 25%  
 Griggs' complete..... 40 & 10%  
 Griffin's Hack Saw Blades..... 40 & 10%  
 Star Hack Saws and Blades..... 25%

**Scroll—**

Barnes' Builders' and Cab Makers' \$15, 25%  
 Barnes' Scroll Saw Blades..... 35%  
 Rogers, complete, \$10.00..... 25%  
 Rogers, complete, \$4.00..... 25%

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Scale Beams—**

See Beams, Scale.

**Scales—**

Chattillon's Eureka..... 25%  
 Chattillon's Favorite..... 40%  
 Chattillon's Grocers' Trip Scales..... 40%  
 Family, Turnbills..... 80 & 10 & 10%  
 Hatch, Counter, No. 171, good quality..... \$ doz \$17.00 @ \$18.00  
 Hatch Tea, No. 161..... \$ doz \$9.00 @ \$10.00  
 Blehlie Bros' Platform..... \$ doz \$10.00 @ \$11.00  
 Union Platform Plain..... \$2.00 @ \$2.10  
 Union Platform, Striped..... \$2.10 @ \$2.20  
 Standard..... 50%

**Scissors, Fluting—**

45%

**Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.)..... \$ doz \$12.00 @ \$13.00  
 Box 1 Handle..... \$ doz \$12.00 @ \$13.00  
 Box 2 Handle..... \$ doz \$12.00 @ \$13.00  
 Defence Box and Ship..... 20 & 10%  
 Foot..... 50 & 10 & 10%  
 Ship, Common..... \$ doz \$10.00 @ \$11.00  
 Ship, R. I. Tool Co..... 10%

**Screen Window and Door****Frames—See Frames****Screw Drivers—**

See Drivers, Screw.

**Screws—****Bench and Hand—**

Bench, Iron..... 55 & 10 & 10%  
 Bench, Wood, Beech..... \$ doz \$2.25  
 Bench, Wood, Hickory..... 20 & 10%  
 Hand, Wood..... 25 & 10 & 10%  
 Hand, Grand Rapids, list..... 35%  
 Coach, Lag and Hand-Rail—  
 Lag, Blunt Point, list Jan. 1, 1890..... 80 & 10 & 10%  
 Coach and Lag, Gimlet Point, list Jan. 1, 1890..... 80 & 10 & 10%  
 Hand Rail, Am. Screw Co..... 75%  
 Hand Rail, H. & B. Mfg. Co..... 70 & 10 & 10%  
 Hand Rail, Sargent's..... 70 & 10%

**Jack Screws—**

Millers Falls..... 50 & 10 & 10%  
 Millers Falls, Roller..... 50 & 10%  
 S. W. Co..... 35%  
 Sargent..... 70%  
 Stearns..... 40 & 10%

**Cork—**

Detroit Cork Screw Co..... 35%  
 H. Beckley Mfg. Co..... 40 & 10 & 10%  
 Williamson's..... 35%  
 Williamson's Forged Worn, Applewood Handle, \$ doz., \$5.00; Rosewood, \$5.50..... 40%

**Machine—**

Flat Head Iron..... 70%  
 Round Head Iron..... 65%

**Wood—**

List January 1, 1891.  
 Flat Head Iron..... 80%  
 Round Head Iron..... 75%  
 Flat Head Brass..... 80%  
 Round Head Brass..... 75%  
 Flat Head Bronze..... 80%  
 Round Head, Bronze..... 75%  
 Rogers' Drive Screws..... 82 & 10%

**Scroll Saws—See Saws, Scroll.****Scythes—**

Grass..... 40 & 10 & 10%  
 Grass..... 40 & 10 & 10%

**Scythe Snaths—**

See Snaths, Scythe.

**Sets—****Awl and Tool—**

Alken's Sets, Awls and Tools..... \$ doz \$10.00 @ \$11.00  
 Common Brad Sets..... 60 & 10 & 10%  
 No. 42, \$10.50; No. 43, \$12.50..... 70 & 10 & 10%  
 Fray's A.C.I. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$5; 5, \$7..... 50%  
 Henry's Combination Haft..... \$ doz \$6.50  
 Millers Falls A.C.I. Tool Hds., No. 1, \$12; No. 2, \$12; No. 3, \$18..... 25%  
 Stanley's Broyal..... \$ doz \$4.00 @ \$4.50  
 No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50..... 30 & 10%

**Nail—**

Round..... \$ gr. \$3.25  
 Square..... \$ gr. \$4.00 @ \$4.25  
 Buck Bros..... 27 & 10%  
 Cannon's Diamond Point..... \$ gr. \$12, 20%

**Rivet—**

Regular list..... 70%

**Saw—**

Atkin's Criterion..... \$ doz No. 1, \$6.00  
 Atkin's Genuine..... \$13.00, 60 & 10 & 10%  
 Atkin's Imitation..... \$ doz \$3.00 @ \$3.25  
 Atkin's Lever..... \$ doz No. 1, \$7.00  
 Avery's Saw Set and Punch..... 50%  
 Bemis & Call Co.'s Cross Cut..... 30 & 10%  
 Bemis & Call Co.'s Plate..... 20%  
 Bemis & Call Spring Hammer..... 30 & 10%  
 Common Lever..... \$ doz \$2.00, 45 & 10%  
 Crescent..... \$ doz \$3.00 @ \$3.50  
 \$24.00 (Koller), No. 1, \$15.00, No. 2, \$24.00..... 40 & 10 & 10%  
 Diaston's Star..... 25%  
 Hammer, Bemis & Call Co.'s new Pat..... 45%  
 Hammer, Hotchkiss..... \$5.50, 10%  
 Hart's Pat. Lever..... 20%  
 Kohler's Giant Royal..... \$ doz \$12.00  
 Leach's..... \$ doz \$7.00 @ \$8.00  
 Leach's, No. 0, \$8.00; No. 1, \$15.00..... 40 & 10%  
 Leopold..... 40 & 10 & 10%  
 Lloyd's Acme..... \$ doz \$15, 40 & 10%  
 Morrill's No. 1, \$15.00..... 40 & 10%  
 No. 3 and 4, Cross Cut, \$23.00..... 40 & 10%  
 No. 6, Mill, \$1.00..... 40 & 10%  
 No. 10, \$1.00..... 40 & 10%  
 No. 11, \$1.00..... 40 & 10%  
 Nash's..... 20 & 10 & 10%  
 Stillman's Genuine..... \$ doz \$5.00 @ \$7.00  
 Stillman's Pattern, Hand, \$ doz \$3.25..... 40 & 10%  
 Cross Cut, \$5.50..... 55 & 10 & 10%  
 Taintor Positive..... \$ doz \$18, 50%

**Sharpeners, Knife—**

Applewood Handles..... \$ doz \$3.00, 50%  
 Rosewood or Cocobola..... \$ doz \$3.00, 50%  
 Taintor Mills..... \$ gr. \$14.40, 25 & 10%

**Shaves, Spoke—**

Iron..... 45%  
 Wood..... 45%  
 Bailey's (Stanley R. & L. Co.)..... 50 & 10%  
 Cincinnati..... 25 & 10%  
 Goodell's..... \$ doz \$9.00..... 25%  
 Stearns..... 40 & 10%

**Shears—**

Acme Cast Shears..... 10 & 10 & 10%  
 American (Cast) Iron..... 60 & 10 & 10%  
 Barnard's Lamp Trimmers..... \$ doz \$3.75  
 Barnard, Solid Steel Blade, Jap'd..... 75%  
 Barnard, Solid Steel Blade, Nickleplated..... 65%  
 First quality..... 80 & 10 & 10%  
 Second quality..... 50 & 10 & 10%  
 Campbell Cutlery Co., Jap'd..... 75%  
 Nickel Plated..... 85%  
 Clause brand, Japanned..... 70%  
 Clause brand, Nickleplated..... 60%  
 Davenport Cutlery Co..... 60 & 10 & 10%  
 Diamond Cast Shears..... 10 & 10 & 10%  
 Galvanic 3/4 to 9 in., \$ doz \$1.00 @ \$1.50  
 Hatch Cutlery Co. Solid Steel Forked..... 60 & 10 & 10%

**Heinrich's, List Dec. 1881..... 60 & 10 & 10%**

Victor Cast Shears..... 75 & 10 & 10%

**Tinner's Snips—**

Cast Handle, Told with Steel..... 40%  
 Niagara Snips and Shears..... 20 & 10%  
 Wrt. Handles, Steel Blades..... \$ (120 & 10%)

**Pruning Shears and Hooks**

Diston's Combined Pruning..... \$ doz \$12.00, 20 & 10%  
 and Saw..... \$ doz \$12.00, 20 & 10%  
 Diston's Pruning Hook..... \$ doz \$12.00, 20 & 10%  
 Dunlap's Saw and Chisel..... \$ doz \$8.50, 30%  
 Henry's Pruning Shears..... \$ doz \$4.00, 25%  
 Henry's Tree Pruner..... 50 & 10%  
 H. S. Lee & Co.'s Pruning Fork..... 40 & 10%  
 Levin Pruner No. 1, \$15.00..... 40 & 10%  
 Levin Pruner No. 2, \$21.00..... 40 & 10%  
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25..... 40 & 10%  
 Pruning Shears, Henry's Pat..... \$ doz \$3.00 @ \$3.25  
 Pruning Shears, Conn. Pat..... \$2.50 @ \$3.00  
 P. S. & W. Co., Combination..... 60%  
 Wheeler, M. & C. Co., Combination..... \$ doz \$12.00

**Tinner's, &c.—**

Shears and Snips (P. S. & W.)..... 30 & 10%  
 Snips, J. Mallinson & Co..... 35 & 10%

**Sheaves—**

Corbin's list..... 60 & 10 & 10%  
 M. W. Co., list July 1888..... 50 & 10 & 10%  
 Moore's Anti-Friction..... 50%  
 Patent Roller..... 60 & 10 & 10%  
 Patent Roller, Hatfield's..... 75%  
 R. & E., list Dec. 18, 1885..... 55 & 10%  
 Russell's Anti-Friction, list Dec. 1885..... 60 & 10%

**Sliding Shutter—**

Reading list..... 60 & 10 & 10%  
 R. & E., list Dec. 18, 1885..... 60 & 10 & 10%  
 Sargent's list..... 70%

**Shells—**

Brass Shot Shells, Club, Rival, Climax..... 65 & 10%  
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge (\$7.50 list)..... 20 & 10 & 10%  
 Smokeless brand, 12, 10, 16 gauge..... 40 & 10%  
 Star, Club, Rival and Climax brands..... 35 & 10 & 10%  
 Trap brand, 12 and 10 gauge..... 35 & 10 & 10%

**Shells, Loaded—**

Standard List, July 19, 1890..... 40 & 10 & 10%  
 2% cash, 10 days.

**Ship Tools—**

L. & J. White..... 30 & 10%

**Shoes, Horse Mule, &c.—****Horse—**

Burden's, Perkins', Phoenix, Standard, Diamond State, Brydon, Bow and Crescent..... \$5.50 @ \$6.00  
 Brydon's Frog Pressure, at factory \$5.00

**Mule—**

Add \$1 per keg to above prices.

**Ox Wrought—**

Ton lots..... \$ doz \$100 @ \$110  
 1000 lb lots..... \$ doz \$100 @ \$110  
 500 lb lots..... \$ doz \$100 @ \$110

**Shot—**

**Snaps, Harness, &c.-**  
Anchor 1, & S. Mfg. Co., 50¢  
Andrews, 50¢  
Cover's Saddle Works, Triumph, 50¢  
Covered Springs, 60¢  
Covert, 50¢  
Covert, New Patent, 50¢  
Covert, New R. E., 50¢  
Fitch's, 50¢  
German, New List, 50¢  
Hotchkiss, 10¢  
Kelley & Woolworth's Steel Harness, 50¢  
John Prots Snaps, 70¢  
Sargent's Patent Guarded, 70¢

**Spathe-**  
Boyle, 50¢

**Soldering Irons-**  
See *old iron*.

**Spittoons, Cuspidors, &c.**  
Standard Fiberware, 50¢

**Spittoons, Dally, 8-in. No. 1, 10 and 11 in. 50¢**

**Spoke Shaves-**  
See *wood, 10¢*.

**Spoke Trimmers-**  
See *Trimmers, Spoke*.

**Spoons and Forks-**  
Tinned Iron-

Basting, Cen. Stamp, Co.'s list, 70¢  
Buffalo, S. & Co., 50¢  
Solid Table and Tea, Cen. Stamp, 70¢

**Silver Plated-**  
6 months or 5¢ cash 30 days:

L. Boardman & Son, 50¢  
Holmes & Edwards Silver Co., 40¢  
Meriden Brit. Co., Rogers, 40¢  
Reed & Barton, 40¢  
Rogers & Bros., 40¢  
Rogers & Hamilton, 40¢  
Wm. Rogers Mfg. Co., 40¢  
Simpson, Hall, Miller & Co., 40¢

**Miscellaneous-**  
Boardman's Britannia Spoons, case 10¢

Boardman's Nickel Silver, list July 1, 1891, 60¢  
Britannia, 60¢  
German Silver, 60¢  
Nickel Silver, 60¢  
Holmes & Edwards Silver Co., 50¢  
No. 24 German Silver, 50¢  
No. 30 Silver Metal, 50¢  
No. 49 Nickel Silver, 50¢  
No. 60 Nickel Silver, 50¢  
No. 67 Mexican Silver, 50¢

Rogers & Hamilton:  
Cimeter, Flatware, 40¢  
Cimeter, Steel Goods, 40¢  
Crown Hamilton, Flatware and Cutlery, 30¢  
Steel Goods, 40¢  
Wm. Rogers Mfg. Co., 40¢  
18¢ Rogers' German Silver, 60¢  
22¢ Rogers' Nickel Silver, 60¢  
Rogers' Silver Metal, 50¢

**Springs Door-**  
Champion (oil), 60¢  
Gowell's, No. 1, 10¢; No. 2, 15¢  
Gem (Coll), list April 19, 1886, 20¢  
Hercules, 50¢  
Phenix, 50¢  
Rubber, complete, 50¢  
Star (Coll), list April 19, 1886, 20¢  
Torrey's Rod, 39 in., 50¢  
Warner's No. 1, 10¢; No. 2, 15¢  
Victor (Coll), 60¢

**Carriage, Wagon, &c.**  
Sillitoe, Concord, Platform and Hair, 60¢

**Sprinklers, Lawn-**  
Gibbs Arc, 12¢  
Gibbs Hustler, 12¢

**Squares-**  
Nickel-Plated, 80¢  
Steel and Iron, 60¢  
Try Square and T Bevels, 60¢  
Avery's Bevel Protractor, 50¢  
Avery's Flank Bevel Squares, 40¢  
Dixon's Try Square and T Bevels, 60¢  
Starrett's Micrometer Caliper Squares, 25¢  
Winterbottom's Try and Miter, 30¢

**Squeezers-**  
Fodder-

Blair's, 30¢  
Blair's "Olimar", 30¢

**Lemon-**  
Porcelain Lined, No. 1, 10¢; No. 2, 15¢

Wood, Common, 10¢  
Wood, No. 2, 15¢  
Dean's, No. 1, 10¢; No. 2, 15¢

Dunlap's Improved, 10¢  
Hotchkiss Straight Flash, 10¢  
Jennings' Star, 10¢  
King, 10¢  
Little Giant, 10¢  
Sammis, No. 1, 10¢; No. 2, 15¢

**Standard Fiber Ware-**  
See *old iron, Standard Fiber*.

**Staples**  
Barbed Blind, 1 in. and larger, 7¢  
Barbed Blind, 1 in., 8¢  
Fence Staples, Galvanized, Same price  
Fence Staples, Plain, Same price  
Grand Crossing Tack Co.'s list, 75¢

**Steel Butchers'-**  
O. & A. Hoffmann's, 40¢  
Nichols Bros., 50¢

**Steel Yards**  
Blacksmith's, 40¢  
Butterfield's Goods, 55¢  
Waterford Goods, 55¢  
Gardner, 55¢  
Green River, 55¢  
Lightning Screw Plate, 55¢  
Reece's New Screw Plates, 55¢  
Reversible Ratchet, 80¢

**Stones, Grind-See Grindstones.**  
Soythe Stones-

Pike Mfg. Co., list April, 1892, 50¢  
Cleveland Stone Co., list Nov 1892, 50¢

**Oil Stones, &c.-**  
Pike Mfg. Co., 50¢

Hindostan No. 1, 10¢  
Sand Stone, 10¢  
Turkey Oil Stone, 4 to 8 in., 40¢

Turkey Slips, 30¢  
Lily White Washita, 30¢  
Rosy Red Washita, 30¢  
Washita Stone, Extra, 30¢

Washita Stone, No. 1, 30¢  
Washita Stone, No. 2, 30¢  
Lily White Slips, 30¢  
Rosy Red Slips, 30¢  
Washita Slips, Extra, 30¢

Washita Slips, No. 1, 30¢  
Arkansas Stone, No. 1, 3 to 5 in., 30¢  
Arkansas Stone, No. 1, 5 to 8 in., 30¢

Lake Superior, 30¢  
Lake Superior Slips, 30¢  
Tantite Mills, 30¢

**Stops, Bench-**  
Cincinnati, 25¢  
Crescent, 25¢  
Hotchkiss, 25¢  
McGills, 25¢  
Morrill's, 25¢

Stearns, 25¢  
Terrell's Nos. 1 and 2, 25¢  
Weston's, No. 1, 10¢; No. 2, 25¢

**Stove Polish-**  
See *Polish, Stove*.

**Stretchers Carpet-**  
Cast Iron, Steel Points, 75¢  
Cast Steel, Polished, 75¢  
Sackett, 75¢  
Bullard's, 75¢

**Strops Razor-**  
Badger's Belt and Com., 25¢  
Campbell Cutlery Co., Net prices  
Electric Cutlery Co., Net prices  
Genuine Emerson, 25¢  
Imitation, 25¢  
Jordan's Pat. Padded, list Nov. 1, '89, 50¢  
Lamont Combination, 25¢  
Torrey's, Net prices

**Stuffer Sausage-**  
Miles Challenge, 25¢  
Perry, 25¢  
221, 25¢  
Draw Cut No. 4, each \$30.00, 25¢  
Enterprise Mfg. Co., list Jan 17, '93, 25¢  
Silver's, 40¢

**Sweepers, Carpet and Lawn-**  
Acme, 25¢  
Advance, 25¢  
Banner Jap'd, 25¢  
Gold Medal, 25¢  
Prize, 25¢  
Superior, 25¢  
Cosmopolitan, 25¢  
Furniture Protector, Jap., 25¢  
Furniture Protector, Nickel, 25¢  
Furniture Ocean, 25¢  
Hall, 25¢  
Crown Jewel, No. 1, 15¢; No. 2, 20¢  
Domestic, 25¢  
Domestic, No. 2, 25¢  
Easy Jap'd, 25¢  
Garland, 25¢  
Gilt Edge, 25¢  
Grand Rapids, 25¢  
Grand Republic, 25¢  
Housewife's Delight, 25¢  
Imperial, 25¢  
Imported Parlor Queen, 25¢  
Japanned, 25¢  
Nickel, 25¢  
Ladies' Friend, 25¢  
Ladies' Friend No. 2, 25¢  
Model, 25¢  
Parlor Queen, 25¢  
Pleader, 25¢  
Our Own, 25¢  
Rapid Jap'd, 25¢  
Reliable, 25¢  
Select, 25¢  
Standard, 25¢  
Supreme, 25¢  
Triumph, 25¢  
Bissell Carpet Sweeper Co. make the following rebates:  
\$.00 per doz. in 5 doz. lots.  
\$.20 per doz. in 10 doz. lots.

**Lawn-**  
Thompson Mfg. Co., 30¢  
Davies Lawn, 25¢

**Tacks, Brads &c.-**  
List October 19, 1889. Old established straight weights. Short weight goods are sold at lower prices.

**Carpet Tacks-**  
American Blued, 47¢  
American, Tin'd and Cop'd, 52¢  
Steel, Bright and Blued, 47¢  
Steel, Tinned and Coppered, 52¢  
Swedes Iron, S. S., Blued, 40¢  
Swedes Iron, S. S., Tinned, 47¢  
American Iron Tacks, Foreign, 50¢  
Swedes Iron Tacks-

S. S., Blued, 37¢  
S. S., Tinned, 45¢  
Lanc. Blued, 30¢  
Lanc. Tinned, 37¢  
Upolsters' S., 47¢  
Upolsters' Lanc., 37¢  
Gimp Tacks-

S. S., Blued, 30¢  
S. S., Tinned, 42¢  
Lanc. Blued, 20¢  
Lanc. Tinned, 35¢  
Basket and Trimmers' Tacks-

S. S., 20¢  
Hungarian Nails, 35¢  
Common and Patent Brads, 35¢  
Leathered Tacks, 50¢  
Brush Tacks and Nails, S. S., 20¢  
Loving Glass Tacks, S. S., 5¢  
Picture-Frame Points, S. S., 12¢  
Lace Tacks Blued, 12¢  
Lace Tacks Tinned, 20¢  
Finishing Nails, 52¢  
Trunk and Clout Nails-

Black, 52¢  
Tinned or Coppered, 57¢  
Bed Nails, 57¢  
Chair Nails, 57¢  
Olar Box Nails, 50¢  
Tin Capped Nails, 50¢

**Miscellaneous-**  
Double Point, 30¢  
Wire Carpet Nails, 60¢  
Bill N.Y. Carpet Box, 10¢  
Bonnie Rine, 10¢  
Claw Handle Carpet, 10¢  
Home Tacks, No. 50, 10¢  
Home Tacks, No. 100, 10¢  
Home Tacks, No. 200, 10¢  
Home Tacks, No. 400, 10¢  
Parlarian Gilt Nails, cartoon, 50¢  
Plymouth Rock Carpet Tacks, 20¢  
Upolsters' Nails, 50¢

**Wire Brads and Nails**  
Steel-Wire Brads, R. & E. Mfg. Co.'s list, 50¢

**Tanks Oil-**  
Emerald, S. S. & Co., 30-gal. \$8.75; 60-gal. \$11 each, 50¢

**Tapes, Measuring-**  
American, 40¢  
Chesterman's, Regular list, 25¢  
Excelsior, Special list, 20¢  
Spring, 40¢

**Thermometers-**  
Tin Case, 80¢

**Thimble Skins-See Skins.**

**Ties Bale-Steel.**  
Standard Wire, list, 50¢

**Tinners' Shears, &c.-**  
See *Shears, Tinners' &c.*

**Tinware-**  
Stamped, Japanned and Piced, list Jan 20, 1887, 70¢

**Tire Benders, Upsetters, &c.-See Benders and Upsetters Tire.**

**Tobacco Cutters-**  
See *Cutters, Tobacco*.

**Tools-**  
Coopers'-

Albertson Mfg. Co., 25¢  
Barton's, 20¢  
Bradley's, 30¢  
Sandusky Tool Co., 30¢  
Shaves Cincinnati Tool Co., 20¢  
L. & J. J. White, 20¢

**Lumber-**  
Cant Hooks, "Blue Line", 10¢  
Cant Hooks, Common Finish, 10¢  
Cant Hooks, Mail, Socket Clasp, "Blue Line", 10¢  
Cant Hooks, Mail, Socket Clasp, Common Finish, 10¢  
Cant Hooks, Clip Clasp, "Blue Line", 10¢  
Cant Hooks, Clip Clasp, Common Finish, 10¢  
Band Spikes, 10¢

Pike Poles, Pike & Hook, 12¢  
11.50; 14 ft., 12.50; 16 ft., 14.50;  
18 ft., 17.50; 20 ft., 21.50.  
Pike Poles, Pike only, 12¢  
10.00; 14 ft., 11.00; 16 ft., 13.00; 18 ft., 16.00; 20 ft., 20.00.  
Pike Poles, not ironed, 12¢  
8.00; 14 ft., 8.70; 16 ft., 9.00; 18 ft., 12.00; 20 ft., 16.00.  
Mail, Iron Socket Peavies, 10¢  
Ring Peavies, Common, 10¢  
Steel Socket Peavies, 10¢  
Setting Poles, 12¢  
14 ft., 15.00; 16 ft., 17.00.  
Swamp Hooks, 10¢

**Saw-**  
Atkins' new list, 40¢  
Simonds', 35¢

**Transom Lifters-**  
See *Lifters, Transom*.

**Traps-Game-**  
Blake's Patent, 40¢  
Newhouse, 40¢  
Onida Pattern, 75¢  
Sensible, 33¢

**Mouse and Rat-**  
Cyclone, 55¢  
Dandy, 10¢  
Hotchkiss Metallic Mouse, 5-hole traps, 10¢  
10¢, 75¢; in full cases, 50¢  
Hotchkiss Imp. Rat Killer, 10¢  
Hotchkiss New Rat Killer, 10¢  
Ideal, 10¢  
Mouse, Bonanza, 10¢  
Mouse, Cage, Wire, 10¢  
Mouse, Catch-alive, 10¢  
Mouse Wood, Choker, 10¢  
Mouse, Rat, Wire, 10¢  
Mouse, Sensible, 33¢  
Rat, 10¢  
Rat, Sensible, 33¢  
Schuyler's Rat Killer, 10¢  
Waddell's Go Bang, 10¢

**Fly-**  
Balloon, Globe or Acme, 10¢  
Harper, Champion or Paragon, 10¢  
Triers-

Butter and Cheese, 25¢

**Trimmers, Spoke-**  
Bonney's, 10¢  
Ives', No. 1, 15¢; No. 2, 12¢  
Stearns', 20¢  
Douglas', 20¢  
Cincinnati, 25¢

**Trowels-**  
Brade's Brick, 25¢  
Clement & Maynard's, 20¢  
Diston's Brick and Plastering, 25¢  
Lathrop's Brick and Plastering, 20¢  
Peace's Plastering, 25¢  
Reed's Brick and Plastering, 15¢  
Rose's Brick, 25¢  
Worrall's Brick and Plastering, 20¢  
Cleaves' Angle Trowel, 10¢  
No. 2, 30¢; No. 3, 15¢. net 10¢  
Garden, 70¢

**Trucks, Warehouse, &c.-**  
B. & L. Block Co.'s list, 40¢  
Barnard's, 40¢  
Daisy Stove Trucks, Improved pattern, 10¢  
Thompson Mfg. Co., 40¢  
See *Pipe*.

**Tubes, Boiler-**

**Twine-**  
Flax Twine, 10¢  
No. 1, 10¢  
No. 2, 10¢  
No. 3, 10¢  
No. 4, 10¢  
No. 5, 10¢  
No. 6, 10¢  
No. 7, 10¢  
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No. 93, 10¢  
No. 94, 10¢  
No. 95, 10¢  
No. 96, 10¢  
No. 97, 10¢  
No. 98, 10¢  
No. 99, 10¢  
No. 100, 10¢

**Vises-**  
Solid Box, 50¢

**Parallel-**  
Backus and Union, 40¢  
Bonney's, 50¢  
Double Screw Leg, 15¢  
Slater & Norris Double Screw, 15¢  
Hollands', 35¢  
Howard's, 40¢  
Massey Quick Action, 20¢  
Merrill's, 15¢  
Merrill's Falls, 40¢  
Moore's, 20¢  
Parker's, 20¢  
Prentiss', 20¢  
Sargent's, 70¢  
Simpson's Adjustable, 40¢  
Stephens', 25¢  
Trenton, 40¢  
Wilson's, 50¢

**Saw Filers-**  
Bonney's, Nos. 2 & 3, 15¢  
Economy, 10¢  
Hopkins', 10¢  
Reading, Common, Nos. 0, 1, 2 & 3, 10¢  
Stearns' Rubber Jaw, No. 10 & 38, 35¢  
Westworth, 20¢

**Miscellaneous-**  
Bauer's Pipe Vises, 10¢  
Cincinnati, 25¢  
Cowell Hand Vises, 20¢  
Enterprise Pipe Vises, each \$3.00, 40¢  
Massey Combination Pipe Vise, 35¢  
Phenix Hand Vises, each \$3.00, 35¢

**Wads-Price Per M.**  
U.M.C. & W.R.A.-B. E., 11 up, 88¢  
U.M.C. & W.R.A.-B. E., 9 & 10, 82¢  
U.M.C. & W.R.A.-B. E., 8, 80¢  
U.M.C. & W.R.A.-B. E., 7, 78¢  
U.M.C. & W.R.A.-P. E., 11 up, 1.15  
U.M.C. & W.R.A.-P. E., 9 & 10, 1.15  
U.M.C. & W.R.A.-P. E., 8, 1.70  
U.M.C. & W.R.A.-P. E., 7, 1.80  
Eley's B. E., 11 and larger, \$1.70  
Eley's P. E., 12 to 20, \$3.00

**Wagon Boxes-**  
See *Boxes, Wagon*.

**Wagon Jacks-**  
See *Jacks, Wagon*.

**Ware, Hollow**  
Cast Iron, Hollow

Stove Hollow-Ware, 60¢  
Unground, 65¢  
Gray Enamelled Ware, 50¢  
Stove, 50¢  
Maslin Kettles, 80¢  
Bollers and Saucepans, 40¢  
White Enamelled Ware, 70¢  
Maslin Kettles, 60¢  
Bollers and Saucepans, 60¢  
Rustless Hollow Ware, 50¢  
Tinned Bollers and Spans, 60¢

**Enamelled-**  
Agate and Granite Ware, list Jan. 1, 1894, 25¢  
Ironclad Enamelled Ware, Old list, 50¢

**Kettles-**  
Galvanized Tea-Kettles, 3.50  
Each, 5¢ 8¢ 5¢ 7¢

**Steel Hollow Ware.**  
Avery Spiders and Griddles, 60¢  
Avery Kettles, 60¢  
Standard ribe, Per Doz.  
Plain, Decorated, 7.50

**Indurated Fiber-**  
Basins, Ringed, 2.80  
Butter Bowls, 17 and 19-in. (3 pieces), 1.50  
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), 2.55  
Liquid Measures, pt., qt. and funnell (4 pieces), 1.20  
Spittoons No. 2, 50¢  
Washbasins, Nested, Nos. 0, 1, 2, and 3 (4 pieces), 5.75  
See also Falls.

**Washers-**  
Size hole, 5-16 3/4 1/2 5/16 1/4  
Washers, 5¢ 4¢ 3¢ 2¢  
In lots less than 2000, 1¢ add, 5¢ boxes 14 to list.

**Washer Cutters-**  
See *Cutters, Washers*.

**Water Coolers-**  
See *Coolers, Water*.

**Wedges-**  
Iron, 2¢  
Steel, 3¢

**Weights Sash-**  
Ton lots to foundry, 1 ton, 15.00; 10 lb, 32.75

**Well Buckets Galvanized-**  
See *Falls, Galvanized*.

**Wheels Well-**  
3 in., 2.00; 10 in., 32.50; 12 in., 32.75

## Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Drivins.	\$13.00	\$20.00	\$22.00	\$24.00	\$27.00	\$30.00	\$33.00	\$36.00
Eureka, Two-thirds Whalebone.			15.00	16.50	18.00	20.00		
Bull Bone, Half-length Whalebone.				11.00	12.00	13.00	15.00	
bone.				8.00	8.50	9.50	10.50	12.00
True Grip, Raw Hide Center.	6.00	6.00	6.00	6.50	7.00	7.50	8.00	
New Name, Stocked Java, Black and Wine Colors.					6.00			
Americus, 98 Pen Whip.					6.00			
Gents' Light Driving No. 111.					6.00			
Gents' Light Driving No. 106.					5.00			
Hand-made Stocked Java No. 108.					3.75	4.00		
A large variety of cheaper grades.								
Team Whips.								
Toy Whips.								
Hardware Assortment, 10 American, 75 Whips for \$50.00.								

## Wire and Wire Goods—

## Iron—

Market,	Br. & Ann., Nos. 0 to 18.	Extra 50 100
	75¢ 100¢ 75¢ 100¢	often given
	Cop'd, Nos. 0 to 18, 75¢ 100¢	
	Galv., Nos. 0 to 18, 70¢ 100¢	
	Tin'd, Tin'd, Nos. 0 to 18, 70¢ 100¢	

Stone,	Br. & Ann'd,	Extra 10%
	Nos. 16 to 18, 80%	
	Nos. 19 to 26, 80%	
	Nos. 27 to 36, 80%	
	Ann. Steel Wire	
	Brass, 1st Jan. 18, 1884, 40%	
	Cast Steel Wire	
	Copper, 1st Jan. 18, 1884, 40%	
	Galvanized Fence	
	Malin's An'led & Tin'd on Spools, 80%	
	Malin's Brass and Cop. on Spools, 50%	

Steel Music Wire, 12 to 30, Imported... 60¢ 70¢  
 Stub's Steel Wire... 60¢ 70¢  
 Tate's Spooled, Tin'd & Annealed... 60¢  
 Tinned Steel Wire, 18 to 22, 1/2" 60¢  
 Wire Clothes Line see Line  
 Wire Picture Cord, see Cord.

## Bright Wire Goods—

Standard list... 90¢ 100¢ 15¢  
 Wire Cloth and Netting—  
 Galvanized Wire Netting... 30¢ 40¢ 100¢ 15¢

Painted Screen Cloth 100 ft \$1.45 to \$1.50

## Wire Barb—

See Trade Report.

## Wire Rope—See Rope, W're.

## Wrenches—

American Adjustable	40%
Baxter's Adjustable "S"	40% 100% 50%
Baxter's Diagonal	80%
Coe's "Mechanics"	50% 100% 50%
Girard Standard	65% 100% 70%
Lamson & Sessions' Engineers'	60% 100%
Lamson & Sessions' Standard	70% 100%
Lamson & Sessions' Agricultural	75% 100% 50%
P. S. & W. Agricultural	80% 5%
W. & B. Diamond	
Acme, Bright	50% 25%
Acme, Nickle	40% 25%

Alken's Pocket (Bright)	\$6.00, 50¢ 100%
Alligator	50%
Always Ready	25¢ 50%
Bemis & Call's	
Adjustable S	35¢ 50%
Brigg's Pattern	80% 100%
Combination Brace	40% 100%
Combination Bright	40% 50%
Cylinder or Gas Pipe	45¢ 50%
Extra Heavy	45%
Merrick's Pattern	45%
No. 8 Pipe Bright	55%
Bit Wrench, Adj. Tatum's	100%
Boardman's	30%
Cincinnati Brace Wrenches	25% 100%
Diamond Steel	55% 35%
Donohue's Engineer	20% 100%
Eagle	80% 100%
Hercules	70% 100%
Tate's Vice Wrench	65% 100% 50%
The Favorite Pocket	40% 100%
Walker's	55% 35%
Webster's Pat. Combination	25%

## Wringers, Clothes

Am. Wringer Co.'s 1st July 1, 1892	2% cash
Colby Wringer Co., 1st May 1, 1892	2% cash
Lovell Mfg. Co., 1st July 1, 1892	2% cash
Peerless Mfg. Co., 1st Feb., 1892	2% cash
National Wringer & Mfg. Co., 1st June 1, 1892	2% cash

## Wrought Goods

Staples, Hooks, &c., 1st March 17, 1892	85% 100% 85% 100%
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## Paints, Oils and Colors.—Wholesale Prices.

## Animal and Vegetable

## Oils—

Linseed, City, raw, per gal.	54 @ 55
Linseed, City, boiled	57 @ 58
Linseed, Western, raw	53 @ 54
Lard, City, Extra Winter	55 @ 56
Lard, City, Prime	53 @ 54
Lard, City, Extra No. 1	52 @ 53
Lard, City, No. 1	52 @ 53
Lard, Western, prime	52 @ 53
Cotton-seed, Crude, prime	26 @ 29
Cotton-seed, Crude, off grades	26 @ 28
Cotton-seed, Summer Yellow, prime	30 @ 32
Cotton-seed, Summer Yellow, off grades	30 @ 32
Sperm, Crude	60 @ 62
Sperm, Natural Spring	60 @ 62
Sperm, Bleached Spring	65 @ 67
Sperm, Natural Winter	70 @ 72
Sperm, Bleached Winter	70 @ 72
Whale, Crude	40 @ 42
Whale, Natural Winter	40 @ 42
Whale, Bleached Winter	45 @ 47
Whale, Extra Bleached	47 @ 49
Sea Elephant, Bleached	47 @ 49
Winter	26 @ 28
Menhaden, Crude, Sound	25 @ 26
Menhaden, Crude, Southern	25 @ 26
Menhaden, Light Pressed	30 @ 31
Menhaden, Bleached Winter	35 @ 37
Menhaden, Extra Bleached	37 @ 39
Tallow, City, prime	43 @ 45
Tallow, Western, prime	43 @ 45
Cocoanut, Ceylon	54¢ @ 55¢
Cocoanut, Cochin	74¢ @ 75¢
Cod, Domestic	34 @ 35
Cod, Foreign	35 @ 36
Red Elaine	36 @ 38
Red Saponified	44¢ @ 45¢
Bank	28 @ 29
Straits	28 @ 29
Olive, Italian, bbls.	66 @ 68
Neatsfoot, prime	60 @ 65
Palm, prime, Lagos	54¢ @ 55¢

## Mineral Oils—

Black, 29 gravity, 25 @ 30	
cold test, per gal	7 @ 7 1/2
Black, 29 gravity, 15 cold test	7 @ 8
Black, 29 gravity, summer	5 1/2 @ 6 1/2

Cylinder (light, altered)	12 @ 16
Lead, red, kegs	10 @ 13
Paraffine, 23 1/2 @ 24 gravity	11 @ 12
Paraffine, 25 gravity	10 @ 11
Paraffine, 28 gravity	7 1/2 @ 8
Paraffine, red	1 1/2 @ 10 1/2

## Paints and Colors—

Barytes, Foreign, 10 ton	\$22.00 @ 24.00
Barytes, Amer. floated	29.00 @ 32.00
Copper, 1st Jan. 18, 1884	16.00 @ 18.00
Barytes, Amer. No. 2	13.00 @ 15.00
Barytes, Amer. No. 3	11.00 @ 12.00
Blue, Celestial	6 @ 8
Blue, Chinese	40 @ 50
Blue, Prussian	25 @ 40
Blue, Ultramarine	8 @ 25
Brown, Spanish	3 1/2 @ 1
Brown, Vandyke, Amer.	3 @ 3 1/2
Brown, Vandyke, English	6 @ 8
Carmin, No. 40, in bulk	2.00 @
Carmin, No. 40, in boxes or barrels	2.10 @
Carmin, No. 40, in ounce bottles	3.00 @
Chalk, in bulk	1.75 @ 2.00
Chalk, in bbls., 100 lb.	38 @ 40
China Clay, English	10 @ 13.00 @ 18.00
Cobalt Oxide, prep'd	9.00 @ 11.00
Cobalt Oxide, black	1.00 @
Cobalt Oxide, black, less 100 lb.	1.90 @
Green, Paris, 170 @ 175 lb	23¢ @ 23 1/2¢
Green, Paris, small pack	25 @ 29 1/2
Rebates, 3¢ lb on lots of 10,000 lb or over; 2¢ lb on 4,000 to 10,000 lb; 2¢ on 2,000 to 4,000 lb; 1 1/2¢ on 1,000 to 2,000 lb; 1¢ on 500 to 1,000 lb purchased during the season.	
Green, Chrome, ordinary	6 @ 12
Green, Chrome, pure	22 @ 25
Lead, Eng., B.B. white	7 @ 8
Lead, Amn. White	4 1/2 @ 4 3/4
In Oil	5 1/2 @ 6 1/2
Lead, White, in oil, 25 lb tin	5 @ 5 1/2
Lead, White, in oil, 12 1/2 lb tin	4 @ 4 1/2
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.	2 1/2 @

Lead, red, bbls. and 1/2 bbls.	5 1/2 @ 5 1/2
Lead, red, kegs	5 1/2 @ 5 1/2
Litharge, kegs	5 1/2 @ 5 1/2
Litharge, bbls. and 1/2 bbls.	5 1/2 @ 5 1/2
Ocher, Rochelle	1.35 @ 1 1/2
Ocher, French Washed	1 1/2 @ 1 1/2
Ocher, German Washed	1 1/2 @ 1 1/2
Ocher, American	1 1/2 @ 1 1/2
Orange Mineral, English	7 1/2 @ 8
Orange Mineral, French	10 @ 10 1/2
Orange Mineral, German	7 1/2 @ 8
Orange Mineral, American	7 1/2 @ 8
Red, Indian, English	5 @ 15
Red, Indian, American	2 @ 5
Red, Turkey	9 @ 14
Red, Tuscan	7 @ 10
Red, Venetian, American	1.10 @ 1.35
Red, Venetian, English	1.10 @ 1.35

Zinc, Frach, Green Seal	8 1/2 @ 9
Zinc, Frach, V. M. X.	6 @ 7
Zinc, Antwerp, Red Seal	6 @ 6 1/2
Zinc, Antwerp, Green Seal	6 1/2 @ 7 1/2
Zinc, German, L. Z. O.	5 @ 6
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over	10 1/2 @
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over	11 @
lots less than one ton	10 1/2 @
lots of less than 1 ton	10 1/2 @
Discounts—French Zinc—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2; 25 bbls., 2 1/2; 50 bbls., 3. No discount allowed on less than bbl. lots.	

## Colors in Oil—

Black, Drop, Frankfurt	25 @ 30
Black, Drop, English	12 @ 15
Black, Drop, Domestic	7 @ 10
Black, Lamplack, Best	20 @ 35
Black, Lamplack, Common	7 @ 15
Black, Ivory	8 @ 15
Blue, Chinese	35 @ 40
Blue, Prussian	20 @ 45
Blue, Ultramarine	12 @ 18
Brown, Vandyke	7 @ 12
Green, Chrome	8 @ 13
Green, Paris	16 @ 18 1/2
Sienna, Raw	7 @ 14
Sienna, Burnt	7 @ 14
Umber, Raw	7 @ 10
Umber, Burnt	7 @ 10

## Putty—

In barrels and 1/2 bbls.	.013¢ @ .014¢
In tubs	.013¢ @ .014¢
In tin cans	.014¢ @ .024¢
In bladders	.013¢ @ .024¢

## Spirits Turpentine—

In regular bbls.	30 1/2 @
In machine bbls.	31 @ 31 1/2

## Glue—

Low Grade	7 @ 9
Cabinet	11 @ 14
Medium White	12 @ 14
Extra White	18 @ 20
French	10 @ 22
English	10 @ 15
Irish	10 @ 12 1/2

## THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

## RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

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Weekly Edition, Issued every THURSDAY MORNING, \$4.50 a year.	Per Annum, Postpaid.
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	Monthly Edition: \$1.25=5/6=6 1/2 francs=5 marks=3 florins=1 1/2 roubles (coin)=6 1/2 lire=5 pesetas.

## RATES OF ADVERTISING: ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION	ONE MONTH	THREE MONTHS	SIX MONTHS	ONE YEAR
\$2.00	7.50	17.50	\$30.00	50.00
New York (Main Office), 96-102 Reade Street,				
Philadelphia, 220 South Fourth Street,				
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